An Roinn Tailte

(Department of Lands)

FO-ROINN IASCAIGH

(Fisheries Division)

REPORT

ON THE

SEA AND INLAND FISHERIES

FOR THE YEAR

1958,

incorporating Statistics of the Capture of Salmon, Sea Trout and Eels, and certain scientific papers relating to fisheries.

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NOTE :—Sea fish are divided into two categories, pelagic and demersal. The term " pelagic " (Greek : " pelagos ", the sea) is applied to those fish which usually swim at or near the surface of the water. The main varieties of pelagic fish landed are herrings, mackerel and sprats. The term " demersal " (Latin : " Demergere ", to plunge down) is applied to those fish which live during adult life at or near the sea bottom. The chief species landed are turbot, brill, soles, plaice, cod, haddock, hake, ling, whiting, conger eel and ray (skate). Shellfish consist of two classes, viz., molluscs, of which the main varieties gathered are oysters, mussels, escallops, periwinkles and cockles, and crustaceans—lobsters, crawfish, crabs, shrimps and prawns.

REPORT

PART I.

SEA FISHERIES.

The steady upward trend shown in the over-all landings of sea fish since 1951 continued in 1958. The figures for demersal fish, while showing a slight decrease in quantity as compared with 1957, increased in value by £23,976. Landings of pelagic fish increased by 15,646 cwt. in quantity and £94,410 in value over the corresponding figures for 1957. The aggregate value of all varieties of shellfish, some of which are not recorded by weight, increased by £51,287.

The following table gives the figures of weight and value of all sea fish (excluding shellfish) since 1949 :

TABLE 1.

Year		Cwt.	£
1958	..	547,377	1,025,505
1957	..	532,475	907,119
1956	..	377,367	787,160
1955	..	303,519	686,195
1954	..	254,714	635,802
1953	..	222,516	545,105
1952	..	203,000	478,774
1951	..	187,645	431,875
1950	..	214,236	442,309
1949	..	234,674	507,342

Appendix 1 of this report gives details of the varieties landed in 1958 and Appendix 2 shows the average value per cwt. of the varieties each year back to 1949. Although wet weather prevailed for months on end during 1958 there was no prolonged spell of strong winds and fishermen were able to put to sea regularly. Landings in the first half of the year, however, showed a substantial falling off when compared with the first six months of 1957 but increased catches in the closing months of the year more than restored the balance. When shortages of home landings occurred, limited imports were permitted to meet demand.

On the criterion of value of fish intake, the order of importance of ports for the year was Dunmore East, Killybegs, Howth, Galway, Dingle, Castletownbere, Dublin and Clogherhead. The appearance of Dunmore East at the top of the list is due to the revival of the winter herring fishing from that port.

DEMERSAL FISHERY.—The quantity of demersal fish landed in 1958 was 258,978 cwt. as against 259,722 cwt. in 1957 and the values were respectively £717,306 and £693,330. As usual, whiting was the variety taken in greatest quantity, followed by ray or skate, haddock, cod and plaice. In order of value, however, plaice took priority over whiting, cod, haddock and ray or skate, black-soles being the most important of the remainder. The most notable feature in the pattern was, perhaps, the enhanced average value of haddock which rose from 42s. per cwt. to nearly 57s. per cwt.

Demand for demersal fish in 1958 was very good all through the year and the consequent high prices benefited the fishermen considerably. Although increased landings of whiting were on offer, prices were so high that the freezing trade was not in a position to obtain its requirements for long term storage. Prime fish continued to command scarcity prices. Increased landings of the prime varieties would certainly bring increased returns to all sections of the industry as the quality of the home landed fish would be its best selling point here and on export markets, should an exportable surplus become available. Distribution of demersal fish throughout the country has improved. Encouragement of this trade would necessitate a better range of varieties at the ports, more practical selling arrangements, and the realization by the fishermen that sales at the ports need not necessarily mean lower net returns.

Danish seine netting is still the chief method of taking demersal fish and approximately 75% of the 1958 catch was taken by this method. Otter-trawling and bottom-trawling continue to be used with reasonable success mainly along the east and south-east coasts. Mid-water trawling is being tried by some skippers on the north-west and south-west coasts with mixed success. Other skippers are interested and it is expected that the use of this type of net will spread. The following table gives the weight, value and average price per cwt. of demersal fish each year for the past decade :—

TABLE 2.

Year	Cwt.	£	Average value per cwt.
			s. d.
1958 ...	258,978	717,306	55 5
1957 ...	259,722	693,330	53 5
1956 ...	225,488	660,647	58 7
1955 ...	193,916	593,190	61 2
1954 ...	169,926	540,690	63 7
1953 ...	147,757	451,901	61 2
1952 ...	134,841	397,276	58 11
1951 ...	119,055	354,536	59 7
1950 ...	119,645	364,702	61 0
1949 ...	151,537	416,275	54 11

PELAGIC FISHERY.—*Herrings :* In former years herring catches were normally the heaviest recorded by variety but, owing to the low unit price, they did not realise in gross as much as some white fish varieties. For the past few years, however, herring catches have increased so greatly that they now rank highest in gross value also ; the fact that herring supplies are scarce generally in Great Britain and continental countries, resulting in a keener demand and better prices, has, of course, had its effect in this direction. The resurgence of the Dunmore East herring fishery is the main reason for the pre-eminence which herring have now attained in the records.

Herring fishing off Dunmore East was satisfactory during the 1958 parts of the two winter seasons, i.e., the end of the 1957/58 season and the beginning of the 1958/59 season. In the first three months of the year, landings there were higher than in that period of the previous year and were mainly taken by seine nets. Landings were cleared satisfactorily and at prices which represented a reasonable return to the fishermen, a large portion of the herring being exported to Britain. Exports to Billingsgate were very much increased and the bulk transport scheme to that market continued to work to the advantage of all concerned. Dutch luggers were on the spot to transport purchased herring to Holland and there was evidence of a more widespread interest in the fishery by continental fishing fleets.

In the early part of the 1958/1959 season, fishing was consistent though not heavy and prices were well in advance of those in the previous season. During this period, herring were taken mainly by ring-nets and drift nets, the latter being fished by British boats ; one Irish drifter operated without great success. New types of 70 ft. boats from the Six Counties, powered by engines of from 150 to 200 h.p., fished wing trawls successfully during the whole season. Large and powerful fleets of continental fishing craft, mainly trawlers, were continuously fishing in the areas south of Dunmore East from late October onwards and are reported to have had considerable success. One experimental trip to the grounds by an Icelandic purse seiner fishing for an Irish fish meal factory was not very productive, though a catch of 470 cran was taken in one haul.

Off the Donegal coast herrings were very scarce up to the end of October, sporadic landings at Killybegs and Burtonport being quickly taken up by the buyers although the quality was not always first-class. Landings increased from early November and, though the quantity landed at Burtonport, Bunbeg and Kincasslagh was slightly in advance of that in the previous year, demand was such that prices were well up and processors were not in a position to purchase to their full handling capacity. Killybegs landings were down considerably due to the failure of the spent herring fishing in the early part of the season. Ring-net fishing by boats of the 50 foot class and drifting by yawls of 28 to 32

feet provided the main bulk of the landings. Two Irish boats using wing-trawls had not much success in their operations. The Icelandic purse seiner already mentioned made experimental trips along the coast from Mulroy Bay to the Stags at Broadhaven but failed to find herring in fishable concentrations outside the exclusive fishery limits, though it appeared from asdic traces recorded by the vessel that satisfactory fishing would have been available inside.

A few large landings of herrings were made in the autumn and winter by drift netters from Achill, but the fish was not of first-class quality. Some herrings were also landed on the south-west coast but were not in sufficient quantity to provide the basis for a processing industry.

Particulars of herring landings for the past ten years are given in the following table :—

TABLE 3.

Year	Cwt.	£	Average value per cwt.
			s. d.
1958 ...	252,759	268,579	21 0
1957 ...	233,365	173,027	14 10
1956 ...	137,849	101,608	14 9
1955 ...	96,560	73,782	15 3
1954 ...	68,322	72,848	21 4
1953 ...	58,981	70,066	23 9
1952 ...	54,947	60,451	22 0
1951 ...	49,823	56,830	22 10
1950 ...	67,840	55,438	16 4
1949 ...	45,300	49,438	21 10

MACKEREL.—The volume of the landings of mackerel in 1958 increased to 35,490 cwt. which is the highest figure since the exceptional year of 1948 when over 150,000 cwt. of this fish were taken. As compared with 1957, however, the unit price was low : the gross value was only £39,570 whereas 22,913 cwt. had realised £36,209 in 1957.

Mackerel fishing by large boats was engaged in on the south-west coast only and, in particular, by boats operating out of Baltimore, County Cork. The major portion of the landings was dispatched fresh to British markets. Sporadic landings of mackerel were also made by yawls and currachs along the west coast and this fish was bought for local distribution. Baltimore and Schull, County Cork, and Valentia and Dingle, County Kerry, were again the main ports into which mackerel were landed in 1958. The total quantity and value and the average value per

cwt. of mackerel for each of the past ten years are given hereunder.

TABLE 4.

Year	Cwt.	£	Average value per cwt.
			s. d.
1958 ...	35,490	39,570	22 4
1957 ...	22,913	36,209	31 7
1956 ...	13,850	24,815	35 10
1955 ...	11,563	18,913	32 9
1954 ...	14,766	21,967	29 9
1953 ...	15,374	22,976	29 11
1952 ...	13,018	20,967	32 3
1951 ...	17,017	19,959	23 5
1950 ...	19,838	20,399	20 7
1949 ...	27,220	38,399	28 3

SHELLFISH.—The takings of shellfish in 1958 brought an appreciably increased income to the fishing community, the total value rising from £239,968 in 1957 to £291,255. There is a constant export demand for lobsters and crawfish and the bigger types of boats, carrying larger trains of pots, have tended to fish for these varieties in recent years. This tendency is reflected in the increases shown for the two varieties, the value of the lobsters taken being far the most important of all, with crawfish next. It is somewhat surprising that the figures for periwinkles are a little down, because there is also a steady demand for this variety but possibly weather conditions were not in favour of picking the fish along the coasts. Norway lobsters continue to grow in importance and follow next in order of value to periwinkles. They are fished for mainly by the fishermen of the east coast and are mostly exported to the Six Counties and to Britain. The following table shows the value of shellfish landings since 1949 :

TABLE 5.

Year	£
1958 ..	291,255
1957 ..	239,968
1956 ..	233,634
1955 ..	196,103
1954 ..	154,525
1953 ..	142,554
1952 ..	124,196
1951 ..	93,604
1950 ..	87,119
1949 ..	108,487

PERSONNEL AND VESSELS.—The rise in the numbers engaged whole-time in fishing, corresponding to the increased numbers of larger vessels being put into commission, was noted in former reports. This tendency continued in 1958 when there were 1,687 men employed whole-time as against 1,613 in 1957. On the other hand, the decline in numbers of those engaged in part-time fishing which had taken place in latter years was arrested in 1958, as the records show that there were 4,528 fishermen of this category compared with 4,499 in the previous year. The number of powered motor boats of the larger class, that is, 25 ton gross and over, engaged whole-time in fishing rose from 133 vessels in 1957 to 142 in 1958. The numbers of all other classes of vessels solely engaged, including the smaller powered boats, sail boats and row boats, were virtually the same, the 1957 figure of 1,247 increasing a little to 1,255. Similarly, the vessels partially engaged in fishing rose from 831 to 834.

TRAINING OF FISHERMEN.—Because of the necessity of providing certificated personnel on the catching side of the industry, a scheme for the training of fishermen as skippers was inaugurated during the year. For admission under the scheme, candidates are required to be not less than 20 years of age and have at least three years' sea fishing experience. The course consists of approximately twenty weeks' practical training on board a fishing vessel and approximately twenty weeks' theoretical training at the Town of Galway Vocational School. Allowances are paid to trainees during training.

Fourteen applicants were admitted to training but four left. Seven, having undergone their practical training, were attending the Town of Galway Vocational School at the end of the year and three trainees had not completed training at sea.

AN BORD IASCAIGH MHARA.—The Sixth Annual Report and Accounts of the Board covered the twelve months ended 31st March, 1958. The main features of the Board's activities as recorded in the Report were as follows :

Ten new boats were issued on hire purchase terms during the year. Issues of boats and gear on hire purchase, credit or cash sales were valued at £185,875. The number of motor fishing vessels the subject of hire purchase transactions at 31st March, 1958, was 107, valued at £648,970 at time of issue.

Two further 56½ foot boats were issued under the scheme for the provision of fishing boats in the Gaeltacht. A fifth boat was completed but had not been put into commission at the end of the year. One 19 foot boat and four 26 foot boats were in course of construction under the scheme.

Of the boats issued 9 were completed in the Board's own yards and 3 were supplied to the Board by other yards.

The quantity of fresh sea fish (excluding shellfish and imported white fish) handled by the Board during the year was 216,681

cwt. valued at £565,683 as compared with 182,742 cwt. valued at £527,605 in the previous year. Auctioning and wholesaling of fresh fish showed a loss of £4,095. The value of shellfish other than mussels sold during the year amounted to £5,415 as compared with £4,283 for the year ended 31st March, 1957. Mussels, treated on a fee basis at Cromane, weighed 18,936 cwt. as compared with 19,727 cwt. in the previous year.

One of the Board's three off-shore vessels carried on normal fishing operations during the year. The others were, however, out of commission; it was decided to re-engine these and work was commenced towards the end of the year. There was an operational loss of £6,349 on the vessels for the year to which was added the Exchequer interest (£2,376) and depreciation and obsolescence (£9,949) making a total loss of £18,674 as against £8,940 for the previous year.

The production at the Killybegs factory during the year was as follows:

	Cwt.
Frozen fish	3,522
Smoked fish	292
Fish meal	2,615
Fish oil	70
Ice	3,272

The fish processing station at Galway was also put into commission during the year. Both factories, however, suffered from lack of supplies and, for the same reason, the Schull station, which was nearing completion at 31st March, 1958, was not put into immediate operation. The operational loss at Galway and Killybegs was £4,089 to which was added Exchequer interest (£1,950) and depreciation (£2,361) making a total loss of £8,400. Ice making plants were provided at Dunmore East and Ballycotton. Work on the installation of a new ice making plant at Killybegs was also put in hands.

During the year the Board received a grant of £32,630 from the Exchequer in aid of administration. Grants totalling £43,765 were also made to the Board for capital development purposes (£40,615 from Fisheries Vote and £3,150 from the National Development Fund—excluding the Gaeltacht Boat Scheme). Advances made to the Board from the Central Fund during the year amounted to £30,350 for capital works and £125,000 for boats and gear.

SEA FISHERIES PROTECTION.—The Naval Service of the Department of Defence arrested six foreign vessels found infringing the exclusive fishery limits in the course of the year. The vessels were of French and British nationality. The skippers were prosecuted and in all cases convictions were secured and fines imposed, while the fish and gear found aboard were forfeited in three cases.

MARINE WORKS.—The Department continued during the year to advise on the provision or improvement of landing facilities as required by the existing fishing fleet. These works are carried out in collaboration with other Government Departments and with Local Authorities.

The question of constructing major fishery harbours at certain suitable sites was considered and a foreign consultant was engaged to help in assessing the requirements for that purpose and in drawing up plans.

SCIENTIFIC INVESTIGATIONS. — The experiments on oysters in Clew Bay were continued during the year. Despite the rough cold weather which prevailed during most of the Summer of 1958 water temperatures were unexpectedly high and a total of 16·3% of all the oysters examined were ripening to spawn. Approximately 29% of oysters examined were found to be spent. Small oysters from the 1957 brood were found to be relatively scarce but those from the 1956 and earlier broods were found in fair numbers.

The investigations started in 1957 into the stocks of lobsters at Dalkey, Co. Dublin were continued during the year. At this landing place, through the courtesy of local fishermen, weekly samples of lobsters were examined and measured throughout the year. In July, 1958, 219 lobsters were tagged, tail-punched and liberated on to the Dalkey fishing grounds. By the end of 1958, 66 (30·1%) of the tagged lobsters had been recaptured, all but 9 in the months of July, August and September. No moulted lobsters were returned by the end of the year nor were there any returns of tail-punched lobsters from the previous year. In June, 1958, 600 tail-punched lobsters were liberated around the Saltee Islands and a number of these were returned in the following months. During August and September, 1958 a detailed study of the lobster fishing grounds off Co. Wexford was commenced. The catches made by boats of three distinct sizes were examined. Data was obtained providing information relating to the proportion of the sexes, age at maturity, times of spawning, length for weight relationships, etc., for comparison with similar data obtained from the Dalkey fisheries. A high density storage unit for small quantities of lobsters for short periods was designed and tried out during the year by Officers of the Department. A report upon this unit has been prepared and is now printed as Appendix No. 25 to this report.

Unselected samples of Norway Lobsters (*Nephrops norvegica*) from the catches made by boats operating in the Irish Sea were examined monthly during the year. Data relating to the changes in the monthly ratio of the two sexes, size at maturity, the time when the females were berried, the length and weight relationship and size distribution were collected.

Progress reports upon the work on Lobsters and Norway Lobsters were made to the Shellfish Committee of the Inter-

national Council for the Exploration of the Sea meeting in Copenhagen.

During the herring season which commenced in 1958 at Dunmore East, Co. Waterford, one of the Department's Officers was present and samples of herrings and scales were taken and examined. A report upon this Fishery by one of the Department's staff is printed as Appendix 24.

During the year a number of fishes, rare or scarce in Irish waters, were recorded. A six gilled Shark (*Hexanchus griseus*) was taken in Dingle Bay in a seine net on the 10th September, 1958. This is the third specimen to be recorded from Irish waters so far. A specimen of the Bonito (*Katsuwonus pelamis*), which has only been recorded on four previous occasions, was taken at Ardmore, Co. Waterford, on the 8th October, 1958. A specimen of the Red-Band or Red-Snake-fish (*Cepola rubescens*) a scarce rather than rare fish, was recorded on the 11th April, 1958, and a specimen of the Greater Weever (*Trachinus draco*) was recorded on the 11th September, 1958, both specimens being taken in Dingle Bay.

A White Skate (*Raia marginata*) taken on rod and line in Clew Bay on the 4th September, 1958, was identified on behalf of the Irish Specimen Fish Committee. Other specimens identified for the Committee included Red and Grey Gurnards (*Trigla cuculus* and *T. gurnardus*), Red Sea Bream (*Pagellus centrodontus*) and a Greater Spotted Dog fish (*Scyliorhinus stellaris*).

INTERNATIONAL AND OTHER CONFERENCES.

(1) The Department's Inspector and Scientific Adviser attended the annual conference of the International Council for the Exploration of the Sea at Copenhagen from the 29th September until the 4th October, 1958. Papers prepared by officers of the Department were read to Salmon and Trout and Shellfish Committees. This country's delegate was re-elected Chairman of the Consultative Committee.

(2) Permanent Commission of the International Fisheries Convention of 1946.—At the invitation of the Irish Government this Commission held its annual meeting in Dublin from the 25th to 29th November, 1958. The meeting was attended by representatives of the fourteen adhering nations, Belgium, Denmark, France, Federal Republic of Germany, Iceland, The Netherlands, Norway, Poland, Portugal, Spain, Sweden, Great Britain, the U.S.S.R. and this country. In addition, observers were present from The International Council for the Exploration of the Sea, The International Commission for the North West Atlantic Fisheries and F.A.O. This country's delegates were the Department's Assistant Secretary in charge of Fisheries and the Department's Inspector and Scientific Adviser together with other officers of the Department acting as advisers.

TECHNICAL ASSISTANCE.—The Swedish harbour consultant engaged in 1957 to advise on fishery harbour development spent two months in this country in 1958 and inspected a number of harbours. Further visits were, however, expected to be necessary in 1959 to complete the assignment. During 1958 also an Icelandic master fisherman was, on the recommendation of F.A.O. engaged for the purpose of giving a course of training to sea fishermen in modern fishing methods and techniques and of advising as to the craft, gear and methods which would be best suited to Irish conditions. He spent five months in this country visiting ports and for the purpose of instructing fishermen he was put in charge of a new 56 foot fishing boat equipped with first-rate gear and instruments and demonstrated the value of the methods and techniques he recommended. Other technical assistance projects undertaken in 1958 included (1) a visit by an officer of the Department to East Germany and Italy to study eel-fishing techniques in connection with plans for the development of eel-fishing in this country ; (2) visits by officers of the Department to marine laboratories in Great Britain and the Netherlands in connection with the proposed establishment of a marine research station in this country ; (3) a visit by an officer of the Department to the Netherlands, Germany, Denmark and Sweden to make special studies of gear and fishing boats and (4) biological survey of Poulaphouca reservoir to ascertain what measures can be taken to restore to normal the growth of fish, particularly trout, in artificially created lakes.

LEGISLATION.—During the year two Statutory Instruments and two Bye-Laws were made, particulars of which are given in Appendix No. 20.

PART II.

INLAND FISHERIES.

EXTENT OF FISHERY DISTRICTS AND NAMES OF THE PRINCIPAL RIVERS IN EACH DISTRICT.

District	Extent of District	Principal Rivers
No. 1 Dublin	Most easterly point on Red Island, Skerries, to Wicklow Head.	Liffey Vartry.
No. 2 Wexford	Wicklow Head to Kiln Bay, east of Bannow Bay, Co. Wexford.	Slaney Avoca
No. 3 Waterford	Kiln Bay, east of Bannow Bay to Helvick Head, Co. Waterford.	Suir Barrow Nore.
No. 4 Lismore	Helvick Head to Ballycotton Pier, Co. Cork.	Blackwater, Funshion, Bride, Awbeg.
No. 5 Cork	Ballycotton Pier to Crow Head, Co. Cork.	Lee, Owenboy, Bandon, Argideen, Ilen, Mealagh, Owvane, Coomhola, Glengarriff, Adrigole.
No. 7 Kerry	Crow Head, Co. Cork, to Kerry Head, Co. Kerry.	Roughty, Sheen, Finnihy, Blackwater, Sneem, Laune, Flesk, Maine, Caragh, Currane, Cummeragh, Inny.
No. 8 Limerick	Kerry Head, Co. Kerry, to Hag's Head, Co. Clare.	Shannon, Deel, Fergus, Mulcair, Little and Upper Brosna, Inny, Maigue, Feale.
No. 9[1] Galway	Hag's Head to the sea point of the boundary between the townlands of Keeraunagark South and Banraghbaun South, Co. Galway.	Corrib, Claregalway.
No. 9[2] Connemara	The sea point of the boundary between the townlands of Keeraunagark South and Banraghbaun South, Co. Galway to Slyne Head, Co. Galway.	Ballinahinch, Recess, Cashla, Owengowla, Invermore, Inverbeg, Screebe, Furnace.
No. 10[1] Ballinakill	Slyne Head to Pigeon Point, Westport Bay, Co. Mayo.	Culfin, Errif, Bundorragha, Dawros, Carrowniskey, Bunowen (Louisburgh).
No. 10[2] Bangor	Pigeon Point to Benwee Head, Co. Mayo.	Newport, Burrishoole, Owenduff, Owengarve, Owenmore, Glenamoy.
No. 11 Ballina	Benwee Head to Coonamore Point, Co. Sligo.	Moy, Cloonaghmore (Palmerston), Easkey.

District	Extent of District	Principal Rivers
No. 12 Sligo	Coonamore Point to Carrickgarve, Co. Sligo.	Ballisodare, Garavogue (Sligo), Bonnet, Drumcliff.
No. 13 Ballyshannon	Carrickgarve to Rossan Point, Co. Donegal.	Erne, Bundrowes, Bunduff, Eske, Eanev Water, Oily, Glen.
No. 14[1] Letterkenny	Rossan Point to Malin Head, Co. Donegal.	Owenea, Gweebarra, Gweedore (Crolly), Clady, Lackagh, Lennon, Crana.
No. 17[2] Dundalk	Carlingford Lough to Clogher Head, Co. Louth	Fane, Dee, Glyde.
No. 17[3] Drogheda	Clogher Head to the most easterly point on Red Island, Skerries, Co. Dublin.	Boyne, Blackwater, Deel.

Note.—The area comprised in the former No. 14[2] or Moville District was, by the Foyle Fisheries Act, 1952, incorporated in the Foyle Area which is administered by the Foyle Fisheries Commission.

INLAND FISHERIES.

The total catch of salmon by all methods in 1958 was 1,653,972 lbs., compared with 1,799,543 lbs. for the previous year. Due however, to better prices obtained during the period of peak-runs in July the value of the catch was greater, the amount being £449,732 compared with £447,817 for 1957. The catch of sea trout amounted to 66,404 lbs., valued at £10,529, compared with 100,503 lbs., valued at £15,615 for 1957. The total quantities and value of salmon and sea trout taken in the years 1956, 1957 and 1958 are shown in Appendix No. 9. The catch in the Foyle Fisheries Commission area (part of which was the former Moville fishery district) is not included in the above mentioned figures but is included in the report of the Foyle Fisheries Commission to which reference will be made later.

During 1958 conditions generally were not favourable towards netting owing to the continuous high water. In some areas the runs of the larger spring fish appear to have been relatively good. The peak in the runs of grilse in most rivers was not reached until late in July and the strength of the runs was certainly greater than that of the previous year. Owing to the late arrival of the grilse runs in most rivers, fishing was exceedingly poor at the end of June and the beginning of July.

Particulars of the catches of salmon made in each Fishery District for the years 1956, 1957 and 1958 are given in Appendix No. 10. The catch of salmon in 1958 was distributed as to the various methods of capture, as follows :—

Draft nets	46·7%
Rod and line	22·7%
Drift nets	17·3%
Stake nets and other commercial methods	13·3%

The percentage of fish taken on rod and line was much higher than in 1957, due, in the main, to the fact that water conditions in most rivers were favourable towards angling, particularly before the middle of July. The actual number of salmon and grilse taken on the rod and line was a record at 49,696 fish, averaging 372,435 lbs., valued at £105,143. This is the highest rod catch ever to be recorded in this country. The average weight of salmon and grilse, landed on rod and line, was 7·5 lbs., compared with 7·4 lbs. and 7·8 lbs. respectively, for 1956 and 1957.

The total number of rod licences (excluding endorsements) issued in 1958 was 8,294 representing an increase of 509 over that of 1957. The average catch of salmon taken by rod and line throughout the country was 5·9 fish, weighing 44·9 lbs. and valued by their captors at £12 13s. 6d. These figures, despite

an increase in the number of licences, were greater than those of 1957. The highest average weight for fish taken on rod and line (13·1 lbs.) was in the Drogheda district where the bulk of the rod caught fish are either small or large spring fish or small summer fish. The lowest average weight (5·5 lbs.) was for the Galway district where the bulk of the rod caught fish are grilse.

The catch of sea trout by all methods showed a decided decrease over that of the previous year in respect of both rods and commercial methods. The sea trout catch was distributed as follows :—

Rod and line	60·7%
Draft nets	35·5%
Other commercial methods ..	3·8%

The average catch of sea trout per rod was 4·9 fish, weighing 4·6 lbs. and valued at 13/6d. Fishery Districts which returned the highest average per rod were Ballinakill (18·6), Connemara (15·6) and Bangor (11·2). During the second half of the sea trout season conditions in many waters were not entirely unfavourable for the rod angler. Generally speaking however, high water, apart from rendering angling ineffective, encouraged the fish to run quickly upstream to the highest reaches of rivers where they were out of reach of anglers.

Drift net fishing for salmon off the Donegal-Mayo coasts, which depends on runs of grilse, was highly successful and the catch was considerably higher than that of 1957 which, in itself, was the highest since 1953 and the second highest since 1950.

The smolt migration in 1958 was considered satisfactory in most areas and the spawning season of 1958–1959 was reported to be exceedingly good. Further beneficial effects of the high water levels were the comparatively small number of cases of pollution which came to notice and the marked reduction in the incidence of furunculosis. Indeed fish mortality generally was extremely low.

During 1958 a number of visits were paid by officers of the Department to fish markets in Great Britain, with a view to investigating the quality of Irish salmon as sold in these markets. The information collected during these visits has been exceedingly useful in the Department's task of ensuring that only the highest quality of Irish salmon reaches foreign markets.

In 1958 the Corporation of Dublin wholesale fish market handled 58,598 salmon and grilse, weighing 407,909 lbs., compared with 53,040 fish, weighing 381,745 lbs., in the previous year. Only in the Dublin wholesale fish market are salmon and grilse sold by auction.

BOARDS OF CONSERVATORS.—Details of the Receipts and Expenditure of Boards of Conservators are given in Appendix No. 16 to this Report.

EMPLOYMENT IN THE INDUSTRY.—Exclusive of persons employed in the marketing and transport of fish a total of 5,397 persons found whole-time or part-time employment in inland fisheries during the year. The figure includes some 3,245 persons engaged in netting for salmon under common law right and 959 employed by Board of Conservators on protection of fisheries during the open and close seasons, the remainder being employed by proprietors of commercial salmon fisheries.

INSTRUMENTS OF CAPTURE.—The total number of fishing licences of all kinds issued during the year was 11,053 representing an increase of 522 on the figure for 1957. The total in recent years were 1957, 10,531 ; 1956, 10,135 ; 1955, 9,027 ; 1954, 8,690 ; 1953, 8,444 ; 1952, 7,990. The numbers of the various classes of licences issued in each fishery district during the year, and the rates of licence duty are given in Appendices 17 and 18 respectively.

SALMON EXPORTS.—The quantity of salmon exported in 1958 was 14,006 cwt. valued at £533,593 as compared with 15,710 cwt. valued at £534,040 in 1957. These figures include landings of salmon in Co. Donegal from waters in the area administered by the Foyle Fisheries Commission. The average export price per cwt. of £38 1s. 10d. obtained in 1958 was higher than the corresponding figure in 1957 which was £33 19s. 10d.

The number of salmon exporters licensed under the Agricultural and Fishery Products (Regulation of Export) Act, 1947, (Export of Salmon) Order, 1954 (S.I. No. 275 of 1954) was 89.

Of the total quantity of salmon exported 12,499 cwt. went to Great Britain and 860 cwt. to France.

ARTIFICIAL PROPAGATION OF SALMON AND SEA TROUT.—In the 1957/'58 spawning season conditions for the capture of spawning fish for artificial propagation was satisfactory at most centres. The output of salmon ova was the largest in many years. A total of 1,195,000 salmon ova and 65,000 sea trout ova were distributed from the Glenties and Lismore hatcheries which are either directly or indirectly controlled by the Department. Salmon ova were produced at ten hatcheries, sea trout ova at three hatcheries and brown trout ova at four hatcheries.

For many years the Department has distributed brown trout ova to angling Associations and others throughout the country, but in 1958 this function was taken over by the Inland Fisheries Trust Incorporated. The Trust purchased from the hatcheries at Loughs Owel and Ennell, respectively, 675,000 and 351,000 ova of brown trout and imported from Great Britain 200,000 ova of brown trout. It also imported 200,000 rainbow trout ova of the Shasta strain. During the year the Trust distributed

145,000 eyed ova, 105,000 unfed fry, 124,000 summerlings, 58,000 fingerlings and 58,000 yearlings of brown trout. Approximately half of the unfed fry summerlings, fingerlings and yearlings were planted in waters controlled by the Trust. In addition the Trust distributed 4,500 summerlings, 6,500 fingerlings and 2,000 yearlings of rainbow trout, mainly in waters controlled by it. The Trust also hatched out for Bord na Mona 250,000 salmon ova which were subsequently released as fry into the river Boyne system.

Details of the ova produced at the various hatcheries are given in Appendix No. 21. Attention is drawn to the fact that the form of this Appendix differs from that of previous years in-as-much as only the hatcheries where fish were stripped have been included, whereas formerly hatching stations relying on stocks of ova from elsewhere were included in the Table.

SCIENTIFIC INVESTIGATIONS.—During 1958 investigations were continued into the movements of salmon in the sea around Ireland. In April and May, 1958, 81 salmon were tagged and released alive at Ardmore, Co. Waterford, from drift nets operated close inshore and 39 recaptures (48%) were made, all but one along the Irish coast. The exception was a fish taken in the Aberdeenshire Dee on the east coast of Scotland. Other notable recaptures were made in the rivers Boyne and Dargle both on the east coast of Ireland and in the river Laune on the south-west. A preliminary report upon this work was given by officers of the Department to the Salmon and Trout Committee of the International Council for the Exploration of the Sea, at Copenhagen in October, 1958.

Tagging of kelts of salmon and sea trout was again carried out at a number of stations, namely Ballisodare, Co. Sligo, Ballyshannon, Co. Donegal, Banteer, Co. Cork, Glenties, Co. Donegal, Inistioge, Co. Kilkenny and Lismore, Co. Waterford. In all, 694 kelts of salmon and 154 kelts of sea trout were tagged at these stations. Recaptures of clean fish totalling 18 salmon and 7 sea trout were made mainly from the taggings of kelts of previous years. Owing to the serious falling-off in the run of salmon in the River Erne in 1957, it was decided, following a public inquiry, that all commercial fishing in the estuary of the river Erne should be prohibited in the 1958 season. An undertaking was, however, given, that certain investigations would be carried out and, accordingly, during the year, experimental nettings of salmon in the estuary of the river were conducted by officers of the Department with a view to ascertaining details of the movements of salmon up the river and through the fish passes. Further experiments on this river are referred to in the section of the report dealing with engineering matters. The records of the number of fish passing through the fish pass at Cathaleen's Falls on the river Erne were also investigated.

In connection with the Irish Specimen Fish Committee on which the Department's Inspector and Scientific Adviser continues to act as Chairman, a large number of sets of scales of notable Irish rod-caught fish were examined in the Department's laboratory and in addition a number of fish were identified in connection with claims submitted to the Committee.

During the year a number of hybrids between bream and rudd were examined by the Department's staff. This hybrid, which at one time was believed to be rare, is apparently quite common in some areas, and a report upon the subject will be prepared in due course.

One of the Assistant Inspectors of Fisheries who acts as a member of the Inland Fisheries Trust has continued to investigate material collected by the Trust in connection with its programme of predator control, particularly as regards the pike. Further evidence of the damage which pike inflict upon trout stocks has become available. This provides ample confirmation of a previous statement that " the pike is one of the greatest obstacles to the full development of brown trout fisheries in many of the more important waters in this country, as well as of the salmon fisheries in waters where the pike exists."

With the appointment of a biologist to the Foyle Fisheries Commission the responsibility of officers of the Department for part of the scientific work on the Foyle system has been taken over by the newly-appointed officer. By arrangement with the Commission, however, the Department's Inspector and Scientific Adviser continues to direct the research programme of the Commission which was continued in 1958 on similar lines to that of previous years.

A number of interesting specimens of freshwater fishes was sent to the Department for examination and identification during the year. They included the two specimens of Cole's char (*Salvelinus colii*) from Inchiquin Lake, Co. Kerry and one from Lough Conn, and three specimens of Gray's char (*S. grayii*) from Lough Melvin. Specimens of two species of Shad, the Allis shad (*Alosa alosa*) and the Twaite shad (*A. finta*) were also obtained during the year. A specimen of the Allis shad was found dead on the shores of the Upper Lake, Killarney. This is the first occasion upon which a fish of this species has been identified from the lakes of Killarney or the river Laune, although the closely-related lacustrine form of the Twaite shad has been known from these lakes for a very long period. Specimens of both the Allis and Twaite shads were obtained during 1958 from the river Ilen near Skibbereen, Co. Cork—a somewhat unusual event as generally only a single species has been identified from most Irish rivers. Seven specimens of the Twaite shad were obtained from the river Slaney, the first shads to be recorded from this river. A report upon these shads was prepared at the close of the period under review for publication in the Irish Naturalists' Journal.

During the year, with the aid of a studentship established under the Technical Assistance Programme, investigations of the trout stocks in Poulaphouca reservoir were commenced. By the close of the period under review a considerable amount of material relating to the trout of Poulaphouca reservoir and their food had been collected. A contribution towards the cost of this studentship was received from the Dublin and District Trout Anglers' Association.

Officers of the Department continued to give assistance and technical and scientific advice to the various Boards of Conservators and they gave evidence in the Courts in several cases where the expert identification of fish scales was necessary in prosecutions conducted by either the Boards of Conservators or the Gárda Síochána.

In a number of cases specimens of fish were sent for examination as to the cause of death. Many of these fish arrived in an advanced state of decomposition which prevented any useful examination being made. It cannot be stated too often that only in rare cases can the cause of death of fish be established especially when mortality is due to oxygen deficiencies or poisoning from non-irritant sources.

OFFENCES AGAINST THE FISHERY LAWS.—The number of prosecutions instituted during 1958 was 249 as compared with 230 in 1957. The Gárda Síochána continued to co-operate with Boards of Conservators in the protection of inland fisheries throughout the year.

FOYLE FISHERIES COMMISSION.—The total catch of salmon and sea trout in 1958 in the area administered by the Commission was above average. As in the 1957 season, flood conditions again favoured the upstream netsmen. Particulars of catches by nets and rods as published in the Seventh Annual Report of the Commission, which covers the period of twelve months ended on 30th September, 1958, were as follows :—

	Salmon		Sea Trout		Total	
	Number	lb.	Number	lb.	Number	lb.
Nets ...	93,622	658,673	1,483	1,916	95,105	660,589
Rods ...	3,122	20,158	4,168	4,366	7,290	24,524
	96,744	678,831	5,651	6,282	102,395	685,113

INLAND FISHERIES TRUST, INCORPORATED.—The Inland Fisheries Trust, Incorporated continued during the year its activities in the promotion and development of brown trout fisheries. For this purpose a Grant-in-Aid, which amounted to £20,000 in the financial year 1958/59, is provided annually from

the Fisheries Vote. During the year under review in addition to actual work of developing fisheries, biological and/or engineering surveys were carried out on various lakes and rivers, with a view to their future development. A number of more general biological investigations concerned with fishery development problems were begun or continued, and contact was maintained with fishery workers in other countries. Trout development work was intensified. Experimental stockings with rainbow trout (Autumn spawning shasta) are proving successful and indications are that rainbows make consistently better growth than brown trout under most conditions. A small brood stock of rainbows has been reared at the Trust's central fish farm at Roscrea. Coarse fish waters were improved in the tourist interest. International sea angling festivals held during the past two years have aroused wide interest in our coastal waters. The Trust's Sea Angling Organiser began a detailed survey of the fishing available at various centres. Close liaison with the Irish Federation of Sea Anglers was maintained and the formation of sea angling clubs and local organisations to cater for visitors was encouraged.

SALMON RESEARCH TRUST OF IRELAND INCORPORATED.—During the year under review further progress was made on the qualitative survey of the aquatic life of the Burrishoole river system. Rearing of salmon of known ancestry was continued.

Tagging of salmon and sea trout smolts and kelts was undertaken. In connection with the tagging of salmon smolts some very useful information relating to the predators of young salmon was obtained. A comprehensive study of the salmon and sea trout of the Burrishoole river system by means of their scales was started.

Towards the close of 1958 the erection of new installations at Lough Furnace was commenced. These installations will ultimately include rearing ponds and holding ponds and traps for ascending and descending fish.

ENGINEERING.—During the year the reservoirs created by the two dams built on the River Clady were filled. Two fish passes to the design of the Electricity Supply Board were incorporated in these dams. They are on the canal lock principle and are operated automatically by an electric time-clock arrangement. In the period from June—September four hundred fish were counted going through the fish-pass at Gweedore by the E.S.B. staff.

As the major portion of the flow of this river will be diverted in future from the lower reaches of its original course by the dam at Gweedore, measures were taken by the E.S.B. in consultation with this Department to offset the effects of the reduced flow of the river on fish life, principally by the provision of improved

facilities for the passage of salmon and sea trout over obstructions in this stretch of the river made more difficult for the fish by the low flow.

Apart from the usual well-known effects of the operation of hydro-electric power stations on the movement of fish in rivers, certain unexpected developments were noted accompanied by reports of a decline in salmon stock in some important rivers, the power potential of which has been harnessed. In the case of the River Erne a series of investigations, biological and engineering, was undertaken. Among these was a study of the passage of smolts through certain turbines, balsa wood boxes, each containing one fish being passed through the machines as had been done in Sweden. The results so far suggest that smolts are not as seriously affected in the passage through the type and size of machine tested as has been alleged. Work on the several problems connected with the effect of hydro-electric station operation on fish continues.

The development of a number of peat-fuelled thermal electric stations gives rise to a series of problems chiefly those of disposal of cooling water and treatment of boiler feed water. A secondary problem arises from the production of the fuel itself, mainly milled peat. So far it is not possible to report any satisfactory means of dealing with the situation, the main difficulty being that caused by the presence in suspension in rivers of large quantities of peat particles originating from the bog workings. The matter is being followed up from the engineering as well as the biological point of view.

Arterial drainage work continued on the catchment systems of the rivers Corrib, Nenagh, Feale, Swilly Burn and Deele. These works were supervised and measures recommended in the fisheries interests were carried out by the Office of Public Works.

The Denil fish-pass arrangement with a counting chamber at its upstream outlet incorporated in the sluice barrage constructed at Galway as part of the Arterial Drainage Scheme for the River Corrib came into operation during the year.

Preliminary proposals for the arterial drainage of the catchment of a number of additional rivers were the subject of frequent consultations with the Office of Public Works and detailed site investigations of the rivers were initiated and carried out. Principal among these were the River Moy, the River Inny, and the River Maine.

A programme for expansion of inland fisheries providing for work on rivers hitherto inacessible or virtually so, to salmon and sea trout, and for the development of eel fisheries was prepared in broad outline. In connection with the programme the Assistant Engineer visited eel fisheries abroad.

The development work on the Inland Fisheries Trust fish farm at Roscrea which was directed and supervised by the Assistant Engineer was brought to a successful conclusion during the year.

The Salmon Research Trust was advised on engineering aspects of various developments proposed by that body and plans were prepared for the construction of salmon and smolt trapping devices and smolt rearing installations.

Technical advice was provided on various engineering matters to the Boards of Conservators, the Foyle Fisheries Commission and others.

LEGISLATION.—The Fisheries (Amendment) Act, 1958 became law on the 1st July, 1958. The main provisions of the Act dealt with the re-enactment, with some extension, of the Salmon Conservancy Fund Act, 1954, power of the Minister to grant fish culture licences, power of the Minister to increase the duties on fishing licences and removal of certain restrictions on the erection and operation of eel fishing engines.

The Fisheries (Consolidation) Bill, 1958 was re-introduced in Seanad Éireann on 4th December, 1958. This Bill had been before the Oireachtas on previous occasions but had lapsed each time on dissolution of Dáil Éireann.

During the year five Statutory Instruments and five Bye-Laws were made, particulars of which are given in Appendix No. 20.

MICHEÁL Ó MÓRÁIN,
Minister for Lands.

21st May, 1960.

APPENDICES TO THE REPORT ON SEA AND INLAND FISHERIES FOR THE YEAR 1958.

APPENDIX No. 1.

Total Quantity and Value of SEA FISH (excluding Salmon) returned as LANDED during the year 1958.

KINDS OF FISH	EAST COAST (Omeath to Carnsore Point)		SOUTH COAST (Carnsore Point to Loop Head)		WEST COAST (Loop Head to Erris Head)		NORTH COAST (Erris Head to Moville)		TOTAL	
	cwt.	£	cwt.	£	cwt.	£	cwt.	£	cwt.	£
Brill	242	1,969	670	5,035	350	2,685	194	1,964	1,456	11,653
Cod	13,224	64,760	5,216	20,720	1,362	6,914	3,174	15,935	22,976	108,329
Conger Eel	422	830	177	475	—	—	62	180	661	1,485
Haddock	2,565	8,869	11,150	30,221	977	3,935	14,315	39,755	29,007	82,780
Hake	1,008	7,383	144	632	110	454	301	1,661	1,563	10,130
Ling	321	737	60	134	—	—	82	240	463	1,111
Plaice	3,866	54,781	7,045	56,640	1,427	12,281	4,533	38,718	19,871	162,420
Ray or Skate	10,878	28,974	7,034	20,228	5,745	13,396	6,083	19,627	29,740	82,225
Soles	261	4,052	1,769	24,610	127	1,693	241	3,922	2,398	34,277
Turbot	181	1,696	465	4,742	157	1,764	187	2,048	990	10,250
Whiting	69,957	59,092	22,850	39,078	10,946	18,115	15,338	33,811	119,091	150,096
Other Demersal	5,362	15,860	9,489	28,964	3,428	6,566	12,483	16,160	30,762	62,550
TOTAL DEMERSAL	111,287	249,003	66,069	226,479	24,629	67,803	56,993	174,021	258,078	717,306
Herring	8,827	10,099	157,336	177,937	5,614	6,494	80,982	74,049	252,759	268,579
Mackerel	11	13	29,407	32,841	2,782	3,109	3,290	3,607	35,490	39,570
Sprats	—	—	—	—	—	—	150	50	150	50
TOTAL PELAGIC	8,838	10,112	186,743	210,778	8,396	9,603	84,422	77,706	288,399	308,199
TOTAL WET FISH	120,125	259,115	252,812	437,257	33,025	77,406	141,415	251,727	547,377	1,025,505
	No.		No.		No.		No.		No.	
Crabs	20,200	525	39,596	1,030	420	9	49,128	1,191	118,344	2,755
Crayfish	—	—	104,298	35,282	74,880	27,979	4,512	1,629	183,690	64,890
Escallops	—	—	172,864	2,489	49,800	622	480	160	223,144	3,271
Lobsters	45,840	8,741	182,837	39,531	117,091	28,414	194,382	47,977	540,150	124,663
Oysters	—	—	44,100	472	567,735	8,385	—	—	611,835	8,857
	cwt.		cwt.		cwt.		cwt.		cwt.	
Norway Lobsters	11,206	34,421	—	—	280	336	500	1,500	11,986	36,257
Mussels	18,044	5,281	28,750	6,495	—	—	—	—	46,794	11,776
Periwinkles	3,626	3,522	12,527	12,561	16,411	16,911	5,126	5,234	37,693	38,231
Other Shellfish	6	21	400	531	—	—	—	—	406	555
TOTAL SHELLFISH	—	52,514	—	98,391	—	82,659	—	57,691	—	291,255
TOTAL ALL FISH	—	311,855	—	535,648	—	160,469	—	307,664	—	1,316,760

APPENDIX No. 2.

Comparison for the eight years, 1951-58, of the Average Prices per cwt. of various kinds of Sea Fish.

	1951	1952	1953	1954	1955	1956	1957	1958
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brill	7 14 5	8 14 11	9 7 10	8 9 10	8 15 3	9 11 4	9 14 11	8 0 0
Cod	4 15 3	4 5 7	4 11 4	5 1 4	4 14 0	4 12 6	4 5 6	4 14 0
Conger Eel ...	1 18 0	1 16 2	1 3 2	1 11 0	1 15 5	2 1 2	2 2 11	2 4 11
Haddock ...	4 15 4	3 12 8	2 2 2	2 8 5	2 0 2	2 5 5	2 2 0	2 17 1
Hake	3 8 11	2 18 7	2 18 0	3 18 3	4 17 6	5 17 11	4 17 0	6 9 7
Ling	2 5 3	3 6 0	3 16 4	3 10 7	3 10 5	2 10 11	2 7 19	2 8 0
Plaice	5 19 2	5 10 11	5 8 9	7 11 2	7 3 7	7 2 3	7 8 9	8 3 6
Ray or Skate ...	2 3 9	2 5 10	2 12 5	2 12 11	2 8 8	2 9 3	2 6 7	2 15 3
Soles	10 5 9	10 8 9	9 12 6	11 5 5	11 5 0	12 11 4	15 6 7	14 5 10
Turbot	7 12 4	7 19 8	9 7 1	8 9 0	7 18 9	9 15 3	9 2 0	10 7 1
Whiting ...	1 13 9	1 12 10	1 14 0	1 12 8	1 12 0	1 9 2	1 3 4	1 5 3
Herrings ...	1 2 10	1 2 0	1 3 9	1 1 4	0 15 3	0 14 9	0 14 10	1 1 3
Mackerel ...	1 2 5	1 12 3	1 9 11	1 9 9	1 12 9	1 15 10	1 11 7	1 2 4
Sprats	0 6 3	0 8 3	0 8 0	0 3 6	0 4 2	0 10 0	0 5 6	0 6 8

N.B.—"Average price" as shown in this table represents total value divided by total weight for each kind of fish, year by year. It does not purport to take direct cognizance of any abnormal rise or fall in price attributable to a seasonal glut or shortage of a particular kind of fish

APPENDIX No. 3.

FISH IMPORTS AND EXPORTS, 1958.

(as compared with those of 1957).

	Quantity		Value	
	1958	1957	1958	1957
I.—IMPORTS	cwt.	cwt.	£	£
Fish (except shellfish) not canned :				
Fresh, chilled or frozen	7,461	4,156	38,624	19,730
Dried, salted, smoked or cooked	29,742	23,643	171,243	131,894
Shellfish, not canned	3,247	3,182	26,114	17,926
Fish (including shellfish) and fish preparations canned ...	20,679	15,678	366,895	249,544
TOTALS	61,129	46,659	602,876	419,094
II.—EXPORTS				
Fish (except shellfish) fresh, chilled or frozen :				
Salmon ...	14,006	15,710	533,593	534,040
Herrings	171,462	118,636	255,288	157,736
Fresh water eels	2,544	2,483	31,904	30,718
Other Fish	52,570	35,299	83,442	57,301
Fish dried, salted or smoked, not canned ...	28,063	21,274	78,278	72,977
Shellfish fresh, chilled, frozen, salted, dried ...	83,054	82,261	374,947	329,558
Fish (including shellfish) and fish preparations canned ...	426	227	3,767	4,898
TOTALS	352,125	275,890	1,361,219	1,187,223

The figures given above for exports of salmon and trout include those relating to exports from the former Moville Fishery District now comprised in the Foyle Area.

APPENDIX No. 4.

HERRING FISHING, 1958.

County	Ports at which more than 500 cwts. were landed	Total quantity cwt.	Value £
Louth	Clogher Head, Greenore and Carlingford	3,675	3,410
Dublin	Howth, Dublin ...	2,701	3,109
Wicklow	Arklow	951	1,868
Wexford	Kilmore Quay, Cahore	2,891	2,784
Waterford	Dunmore East ...	150,832	170,493
Cork	Castletownbere ...	2,522	3,724
Kerry	Dunquin, Dingle ...	2,591	2,648
Clare	—	177	215
Galway	—	835	1,178
Mayo	Achill, Keel and Keem	4,602	5,101
Sligo	—	—	—
Donegal	Burton Port, Kincasslagh, Killybegs, Banbeg, Downings, Magheroarty, Port and Inver	80,982	74,049
	TOTALS	252,759	268,579

APPENDIX No. 5.

MACKEREL FISHING, 1958.

County	Ports at which more than 250 cwt. were landed	Total quantity cwt.	Value £
Louth	—	—	—
Dublin	—	11	13
Wexford	—	235	260
Waterford	Dunmore East, Passage East	5,393	6,343
Cork	Baltimore, Schull, Ballycotton, Castletownbere	20,202	22,291
Kerry	Cahirciveen, Dingle Dunquin	3,577	3,947
Clare	Kilkee and Farraghy	1,092	1,210
Galway	Aran Islands Galway	1,001	1,132
Mayo	Keel and Keem, Louisburgh, Lacken	689	767
Sligo	—	—	—
Donegal	Portnoy	3,290	3,607
	TOTALS	35,490	39,570

APPENDIX No. 6.

PERSONNEL ENGAGED IN FISHING; AND REGIONAL DISTRIBUTION AND CLASSIFICATION OF FISHING CRAFT IN 1958.

HOW ENGAGED (i.e., whether solely or partially)	MEN	Steam Vessels		Motor Vessels						Sail Boats						Row Boats		Total Vessels
				1st Class			2nd Class		3rd Class	1st Class			2nd Class		3rd Class			
		200 tons gross and over	100 tons gross and over but less than 200 tons	25 tons gross and over	20 tons gross and over but less than 25 tons	15 tons gross and over but less than 20 tons	10 tons gross and over but less than 15 tons	Under 10 tons and of 18 feet keel and upwards	Less than 18 feet keel	26 tons net and over	20 tons net and over but less than 25 tons	15 tons net and over but less than 20 tons	10 tons net and over but less than 15 tons and of 18 feet keel and upwards	Under 10 tons and of 18 feet keel and upwards	Less than 18 feet keel	Unclassed A: Open boats of 18 feet keel and upwards and canoes of 18 feet or more over all	Unclassed B: Open boats of less than 18 feet keel and canoes of less than 18 feet overall	
EAST COAST:																		
Solely engaged	458	—	—	55	6	4	6	15	—	—	—	—	—	2	1	33	3	126
Partially engaged	376	—	—	1	1	4	3	20	—	—	—	—	—	11	2	54	3	98
Laid-up	—	—	—	5	3	—	3	1	—	—	—	—	—	6	4	12	—	34
Totals	834	—	—	61	10	8	11	36	—	—	—	—	—	19	6	99	8	258
SOUTH COAST:																		
Solely engaged	632	—	—	50	5	10	22	109	1	—	—	3	3	40	32	148	32	461
Partially engaged	1,222	—	—	—	—	—	7	40	4	—	—	—	4	31	19	112	48	274
Laid-up	—	—	—	1	—	—	—	8	—	—	—	1	—	2	6	13	8	36
Totals	1,854	—	—	51	5	10	34	166	5	—	—	3	9	73	57	273	85	771
WEST COAST:																		
Solely engaged	224	—	—	10	3	4	5	25	—	—	—	—	—	33	7	109	162	418
Partially engaged	1,508	—	—	—	3	2	1	8	—	—	—	—	4	29	15	80	118	285
Laid-up	—	—	—	—	1	1	—	6	—	—	—	—	—	19	5	40	50	123
Totals	1,732	—	—	10	7	7	6	39	—	—	—	—	4	81	27	229	330	806
NORTH COAST:																		
Solely engaged	373	—	—	27	2	6	9	92	—	—	—	—	—	106	3	118	20	302
Partially engaged	1,422	—	—	—	—	4	3	27	1	—	—	—	1	63	11	48	30	107
Laid-up	—	—	—	—	—	—	—	7	—	—	—	—	—	13	3	6	17	40
Totals	1,795	—	—	27	2	10	12	126	1	—	—	—	1	182	17	172	85	635
TOTAL FOR 1958:																		
Solely engaged	1,687	—	—	142	16	24	47	241	1	—	—	2	5	181	42	408	228	1,307
Partially engaged	4,528	—	—	1	4	9	13	104	5	—	—	—	—	134	47	300	208	834
Laid-up	—	—	—	6	4	2	3	22	—	—	—	1	9	40	18	71	72	230
Totals	6,215	—	—	149	24	35	63	367	6	—	—	3	14	355	107	830	508	2,470

APPENDIX No. 7.

TRAWLING AND SEINING, 1958.

Port or Locality	Number of men engaged	Number of boats engaged	Tonnage of Motor Boats			Fishing Period
			Not exceeding 10 tons	Over 10 tons	Over 15 tons	
Clogherhead	42	14	—	—	8	All year.
Balbriggan	30	7	—	—	7	All year.
Skerries	50	16	—	1	10	All year.
Howth	55	15	—	—	10	All year.
Dublin	42	7	—	—	5	All year.
Dun Laoire	5	1	—	—	1	All year.
Wicklow	5	1	—	—	1	All year.
Arklow	80	17	—	—	17	All year.
Wexford	20	4	—	—	4	All year.
Rosslare	10	2	—	—	2	All year.
Kilmore Quay	38	10	3	3	4	All year.
Duncannon	5	1	—	—	1	All year.
Passage East	10	2	—	—	2	All year.
Dunmore East	55	17	2	6	9	All year.
Tramore	8	2	2	—	—	April to September.
Bunmahon	3	1	1	—	—	May to September.
Dunabratton	6	2	2	—	—	May to September.
Helvick	20	4	—	—	2	All year.
Ballycotton	20	5	3	2	—	All year.
Youghal	10	2	—	—	2	All year.
Cobh	8	2	1	1	—	All year.
Kinsale	5	1	—	1	—	All year.
Clonakilty	4	1	—	1	—	April to October.
Union Hall	20	4	—	1	2	All year.
Castletownsend	25	5	—	3	2	All year.
Baltimore	20	4	—	—	4	All year.
Schull	13	3	—	—	3	All year.
Bantry	12	3	—	1	1	All year.
Castletownbere	50	8	1	—	7	All year.
Lauragh	10	2	—	—	2	All year.
Kilmakilloge Sneem	4	1	1	—	—	April to September.
Ballinskelligs	6	1	—	—	1	All year.
Portmagee	25	5	—	—	5	All year.
Cahirciveen	30	5	—	1	4	All year.
Dingle	70	19	—	4	11	All year.
Fenit	4	1	1	—	—	April to October.
Aran Islands	20	4	—	—	4	All year into Galway.
Galway	20	4	—	—	4	All year.
Carraroe	6	1	—	—	1	All year into Galway.
Carna	4	1	1	—	—	October to December.
Cleggan	12	3	—	—	3	April to October.
Murrisk	4	1	—	—	1	All year.
Achill	32	9	—	5	4	All year.
Killybegs	119	25	—	—	23	All year.
Teelin	10	2	—	—	2	All year.
Burtonport	10	2	—	—	2	All year.
Downings	5	1	—	—	1	March to June.
Buncrana	15	3	—	—	3	All the year.
Portaleen and Glengad ...	20	8	6	2	—	January to October.
Greencastle	42	15	4	6	5	All year.
Moville	21	7	4	2	3	All year.
TOTALS	1,159	279	37	32	180	

APPENDIX No. 8.

STATEMENT OF ACCOUNT

in respect of

Repayable Advances for the provision of boats and gear to fishermen made during the period of twenty-seven years to 31st March, 1958 to the Irish Sea Fisheries Association, Ltd., to the date of the Association's dissolution, 23rd April, 1952, and to An Bord Iascaigh Mhara, as from that date.

	£		£
Repayable with Interest on an annuity basis in respect of :—			
(*a*) Advances amounting to £829,642, made up to 31st March, 1957	1,277,832	Repayments to 31st March, 1957	282,378
(*b*) Advances amounting to £90,000, made during year ended 31st March, 1958	157,839	Repayments made during year ended 31st March, 1958 ...	42,485
		Balance outstanding :—	
		Due in arrear 119,233	
		Instalments and Interest not matured ... 991,575	
			1,110,808
	1,435,671		1,435,671

NOTE.—Advances made to the Association and the Board are repayable on the basis of a twenty year annuity in half-yearly instalments.

APPENDIX No. 9.

Quantity and Value of all Salmon and Sea Trout taken in each of the Three Years 1956, 1957 and 1958 by Instruments of Capture.

SALMON.

	1958	1957	1956	1958	1957	1956
	lbs.	lbs.	lbs.	£	£	£
(A) ...	1,653,972	1,799,543	1,443,340	449,732	447,817	415,931
(B) ...	375,452	309,480	264,232	102,089	84,360	76,940
(C) ...	286,137	298,372	250,723	77,804	70,804	66,954
(D) ...	772,405	1,003,428	720,851	210,025	240,912	207,120
(E) ...	219,978	188,263	207,534	59,814	51,741	64,917

SEA TROUT.

	1958	1957	1956	1958	1957	1956
	lbs.	lbs.	lbs.	£	£	£
(A) ...	66,404	100,503	93,152	10,529	15,615	15,136
(B) ...	40,308	56,575	56,192	6,391	8,517	8,519
(C) ...	1,402	3,564	1,231	222	515	177
(D) ...	23,573	37,357	33,599	3,738	6,034	5,964
(E) ...	1,121	3,007	2,130	178	549	476

(A)=Total for *all* engines.
(B)=Total for rod and line.
(C)=Total for drift nets.
(D)=Total for draft nets.
(E)=Total for stake nets, weirs, etc.

This Appendix does not include returns from the former Moville Fishery District.

APPENDIX No. 10.

Quantity and Value of Salmon taken in each of the Three Years 1956, 1957 and 1958 by Fishery Districts.

Fishery District	*	Quantity			Value		
		1958 lbs.	1957 lbs.	1956 lbs.	1958 £	1957 £	1956 £
Dublin	R	5,417	4,137	5,761	1,756	1,297	1,994
	N	2,739	3,494	3,036	768	938	995
Wexford	R	19,771	17,699	18,467	6,308	5,088	5,543
	N	33,335	32,281	25,001	11,802	10,054	9,127
Waterford	R	47,046	32,018	31,242	12,710	8,955	9,506
	N	140,436	161,041	160,454	30,374	40,410	46,607
Lismore	R	46,231	38,129	30,878	12,533	10,374	9,018
	N	131,133	129,947	123,487	32,597	32,456	35,227
Cork	R	26,573	28,812	26,169	8,370	8,606	8,466
	N	64,896	85,681	76,150	17,452	24,816	26,614
Kerry	R	38,947	37,414	25,518	10,714	8,647	7,330
	N	134,531	232,305	115,118	29,775	48,730	31,267
Limerick	R	84,216	52,720	45,445	24,105	15,776	13,415
	N	144,844	135,835	146,530	44,195	38,709	45,996
Galway	R	4,286	4,160	7,734	1,210	1,248	2,225
	N	31,789	36,496	36,507	9,400	10,949	11,615
Connemara	R	5,340	7,740	5,409	1,411	2,322	1,623
	N	Nil	Nil	Nil	Nil	Nil	Nil
Ballinakill	R	6,232	3,502	6,277	1,977	1,116	1,474
	N	19,095	20,578	10,739	4,150	3,717	2,412
Bangor	R	7,428	9,897	4,628	2,098	2,429	1,354
	N	80,073	93,816	39,512	16,859	18,819	11,678
Ballina	R	32,051	27,447	23,443	8,157	6,279	5,870
	N	216,223	238,344	217,671	66,051	63,263	53,569
Sligo	R	5,750	4,638	3,643	1,689	1,391	1,037
	N	30,736	46,878	39,249	7,674	9,843	11,026
Ballyshannon	R	4,566	7,127	3,080	1,329	2,138	949
	N	89,865	68,778	53,094	23,305	12,309	13,932
Letterkenny	R	23,617	22,502	20,568	5,989	5,423	5,046
	N	87,089	133,500	76,318	22,405	25,551	18,352
Dundalk	R	2,671	1,350	1,279	736	217	338
	N	24,195	21,249	16,930	6,083	5,435	5,352
Drogheda	R	12,293	10,178	4,691	4,051	3,054	1,752
	N	50,558	49,840	39,312	21,699	17,458	15,222
TOTALS		1,653,972	1,799,543	1,443,340	449,732	447,817	415,931

*R indicates capture by means of single rod and line ; N by means of nets, weirs, etc.

APPENDIX No. 11.

Quantity and Value of Sea Trout taken in each of the Three Years 1956, 1957 and 1958 by Fishery Districts.

Fishery District		Quantity			Value		
		1958 lbs.	1957 lbs.	1956 lbs.	1958 £	1957 £	1956 £
Dublin	R	1,497	1,447	1,553	227	258	256
	N	8,047	8,108	6,703	1,657	1,630	1,414
Wexford ...	R	878	3,837	2,624	129	460	408
	N	5,384	8,608	6,512	813	1,307	950
Waterford ...	R	883	1,966	1,204	125	318	171
	N	109	710	443	16	110	87
Lismore ...	R	715	1,740	436	102	337	60
	N	1,482	2,761	910	249	426	113
Cork	R	3,853	6,134	6,644	558	1,019	947
	N	1,139	1,419	1,583	184	165	229
Kerry	R	8,307	12,294	12,310	1,198	1,967	2,140
	N	4,384	4,450	2,425	747	752	516
Limerick ...	R	1,455	1,732	1,965	213	228	303
	N	3,408	7,431	10,107	632	1,365	1,999
Galway	R	879	1,440	1,747	154	216	279
	N	533	603	1,453	106	90	221
Connemara ...	R	6,050	9,949	10,880	822	1,542	1,360
	N	Nil	Nil	Nil	Nil	Nil	Nil
Ballinakill ...	R	4,098	636	4,734	667	80	734
	N	820	1,255	187	95	138	22
Bangor	R	3,977	5,766	4,801	551	837	717
	N	517	3,325	724	77	428	103
Ballina	R	823	1,186	549	108	208	73
	N	144	150	321	20	15	34
Sligo	R	207	618	371	31	93	63
	N	36	100	127	7	15	18
Ballyshannon ...	R	459	391	553	49	48	80
	N	74	469	156	11	50	18
Letterkenny ...	R	3,169	5,029	3,845	418	475	576
	N	684	573	954	112	79	151
Dundalk ...	R	105	628	362	60	85	58
	N	306	881	1,564	44	140	275
Drogheda ...	R	1,160	1,782	1,614	179	346	294
	N	762	3,085	2,797	168	388	467
TOTALS ...		66,404	100,503	93,152	10,529	15,615	15,136

*R indicates capture by single rod and aline ; N by means of nets, weirs, etc.

APPENDIX No. 12.

Quantity and Value of Eels taken in each of the Three Years 1956, 1957 and 1958 by Fishery Districts.

Fishery District	Quantity			Value		
	1958 lbs.	1957 lbs.	1956 lbs.	1958 £	1957 £	1956 £
Waterford ...	Nil	1,534	2,631	Nil	156	236
Limerick ...	59,947	106,957	94,627	7,646	13,358	11,683
Galway	58,735	53,008	50,253	7,384	6,805	6,625
Bangor	Nil	32	Nil	Nil	3	Nil
Ballina	8,965	6,249	9,066	716	661	885
Sligo	1,351	517	5,704	106	51	463
Ballyshannon ...	2,050	1,257	4,040	235	129	402
Dundalk	8,922	6,701	5,906	566	582	546
Drogheda ...	10,633	13,458	8,696	1,416	1,756	996
TOTALS ...	150,603	180,923	187,177	18,069	23,501	21,836

NOTE—Figures for 1958 are based on incomplete returns. A total of 284,928 lb. valued at £31,904 was exported during the year.

APPENDIX No. 13.

Total Quantity and Value of Salmon, Sea Trout and Eels taken by all engines in each of the Three Years 1956, 1957 and 1958 by Fishery Districts.

Fishery District	Total Weight for District			Total Value for District		
	1958 lbs.	1957 lbs.	1956 lbs.	1958 £	1957 £	1956 £
Dublin ...	17,700	17,186	17,053	4,408	4,123	4,659
Wexford ...	59,368	62,425	52,064	19,052	16,909	16,028
Waterford ...	188,474	197,269	193,974	43,225	49,949	56,607
Lismore ...	179,561	172,577	155,711	45,481	43,593	44,418
Cork	96,461	122,046	110,546	26,564	34,606	36,256
Kerry ...	186,169	286,463	155,371	42,434	60,096	41,253
Limerick ...	293,870	304,675	298,674	76,791	69,436	73,396
Galway ...	96,222	95,707	97,694	18,254	19,308	20,965
Connemara ...	11,390	17,689	16,289	2,233	3,864	2,983
Ballinakill ...	30,245	25,971	21,937	6,889	5,051	4,642
Bangor ...	91,995	112,836	49,665	19,585	22,516	13,852
Ballina ...	258,206	273,376	251,050	75,052	70,426	60,431
Sligo	38,080	52,751	49,094	9,507	11,393	12,607
Ballyshannon	97,014	78,022	60,917	24,029	14,674	15,381
Letterkenny ...	114,559	161,604	101,685	28,924	31,528	24,125
Dundalk ...	36,259	30,819	26,041	7,489	6,459	6,569
Drogheda ...	75,406	78,343	57,110	27,513	23,002	18,731
TOTALS	1,870,979	2,089,759	1,717,415	478,330	486,933	452,903

APPENDIX No. 14.

Number, Quantity and Value of Salmon taken by Single Rod and Line during each of the Three Years 1956 1957 and 1958 by Fishery Districts.

Fishery District	No. of Fish			Quantity			Value		
	1958	1957	1956	1958	1957	1956	1958	1957	1956
				lbs.	lbs.	lbs.	£	£	£
Dublin ...	697	438	746	5,417	4,137	5,761	1,756	1,297	1,994
Wexford ...	1,963	1,636	1,834	19,771	17,699	18,467	6,308	5,088	5,543
Waterford ...	6,581	3,411	4,442	47,046	32,018	31,242	12,710	8,955	9,506
Lismore ...	5,511	4,704	3,562	46,231	38,129	30,878	12,533	10,374	9,018
Cork ...	3,507	3,591	3,185	26,573	28,812	26,169	8,370	8,606	8,466
Kerry ...	5,587	5,206	3,591	38,947	37,414	25,518	10,714	8,647	7,330
Limerick ...	11,135	6,983	6,718	84,216	52,720	45,445	24,105	15,776	13,415
Galway ...	777	595	1,176	4,286	4,160	7,734	1,210	1,248	2,225
Connemara	893	860	608	5,340	7,740	5,409	1,411	2,322	1,623
Ballinakill ...	925	427	952	6,232	3,502	6,277	1,977	1,116	1,474
Bangor ...	1,020	1,357	710	7,428	9,897	4,628	2,098	2,429	1,354
Ballina ...	5,033	4,288	3,698	32,051	27,447	23,443	8,157	6,279	5,870
Sligo ...	817	640	488	5,750	4,638	3,643	1,689	1,391	1,037
Ballyshannon	591	930	399	4,566	7,127	3,080	1,329	2,138	949
Letterkenny	3,467	3,558	3,134	23,617	22,502	20,568	5,989	5,423	5,046
Dundalk ...	259	136	141	2,671	1,360	1,279	736	217	338
Drogheda ...	933	887	380	12,293	10,178	4,691	4,051	3,054	1,752
TOTALS	49,696	39,647	35,757	372,435	309,480	264,232	105,143	84,360	76,940

APPENDIX No. 15.

Number, Quantity and Value of Sea Trout taken by Single Rod and Line during each of the Three Years 1956 1957 and 1958 by Fishery Districts.

Fishery District	No. of Fish			Quantity			Value		
	1958	1957	1956	1958	1957	1956	1958	1957	1956
				lbs.	lbs.	lbs.	£	£	£
Dublin ...	1,576	1,528	1,770	1,497	1,447	1,553	227	258	256
Wexford ...	1,214	5,755	3,480	878	3,837	2,624	129	460	408
Waterford ...	1,138	1,979	1,203	883	1,966	1,204	125	318	171
Lismore ...	940	1,566	581	715	1,740	436	102	337	60
Cork	4,183	9,342	7,961	3,853	6,134	6,644	558	1,019	947
Kerry	6,846	6,112	10,668	8,307	12,294	12,310	1,198	1,967	2,140
Limerick ...	1,882	2,060	2,362	1,455	1,732	1,965	213	228	303
Galway ...	982	960	2,002	879	1,440	1,747	154	216	279
Connemara ...	6,756	9,949	10,880	6,050	9,949	10,880	822	1,542	1,360
Ballinakill ...	4,222	571	4,124	4,098	636	4,734	667	80	734
Bangor ...	4,525	6,188	5,415	3,977	5,766	4,801	551	837	717
Ballina ...	1,001	1,336	577	823	1,186	549	108	208	73
Sligo	187	539	286	207	618	371	31	93	63
Ballyshannon	524	440	527	459	391	553	49	48	80
Letterkenny ...	3,265	5,010	3,577	3,169	5,029	3,845	418	475	576
Dundalk ...	278	724	408	165	628	362	60	85	58
Drogheda ...	1,125	2,409	1,888	1,160	1,782	1,614	179	346	294
TOTALS ...	40,644	56,468	57,715	38,575	56,575	56,192	6,591	8,517	8,931

APPENDIX No. 16.

RECEIPTS AND EXPENDITURE OF BOARDS OF CONSERVATORS FOR THE YEAR, 1958.

Fishery District	RECEIPTS						EXPENDITURE					
	Opening Balance	Licence Duty	Fishery Rate	Grant from Department	Miscellaneous Receipts	Total Receipts	Salaries	Water Keepers	Law Costs	Travelling and Miscellaneous	Total Expenditure	Closing Balance
	£	£	£	£	£	£	£	£	£	£	£	£
Dublin ...	309	787	298	300	388	1,773	777	721	207	406	2,111	—29
Wexford	429	1,063	1,229	200	19	2,511	200	1,831	14	553	2,598	342
Waterford	325	2,494	2,318	2,000	451	7,263	376	4,761	503	2,288	7,928	—340
Lismore	1,534	1,468	5,249	1,000	53	7,770	910	5,413	8	1,508	7,839	1,465
Cork ...	734	1,507	694	4,500	251	6,952	922	4,700	140	1,566	7,328	358
Kerry ...	2,058	1,958	2,656	1,800	232	6,646	1,066	3,827	169	1,337	6,399	2,305
Limerick	5,557	2,906	3,877	1,800	546	9,129	1,044	4,471	496	4,361	10,372	4,314
Galway	1,682	534	2,310	100	58	3,002	845	1,436	113	650	3,044	1,640
Connemara	326	596	1,666	—	30	2,292	235	1,480	—	225	1,940	678
Ballinakill	—171	336	1,112	—	20	1,468	274	840	39	222	1,375	—78
Bangor ...	774	776	1,124	632	164	2,696	425	1,558	15	546	2,544	926
Ballina	1,107	904	2,959	113	106	4,082	445	3,372	113	591	4,521	668
Sligo	881	355	1,072	15	22	1,464	480	596	17	340	1,433	912
Ballyshannon ...	1,298	583	524	2,608	281	3,996	536	2,201	985	773	4,495	799
Letterkenny	1,565	1,931	1,426	189	263	3,809	555	2,188	101	751	3,595	1,779
Drogheda	1,123	1,248	1,443	400	85	3,176	530	2,176	5	486	3,197	1,102
Dundalk	365	320	308	—	6	634	343	380	73	207	1,003	—4
TOTALS	19,896	19,766	30,265	15,657	2,975	68,663	9,903	41,951	2,998	16,810	71,722	16,837

The foregoing summary of receipts and expenditure does not include sums received by way of Special Local Licence Duty surrendered to the Exchequer in pursuance of Section 45 of the Fisheries (Consolidation) Act, 1959.

PARTICULARS OF LICENCES ISSUED BY BOARDS OF CONSERVATORS FOR THE YEAR 1958

APPENDIX No. 17

Fishery District	Salmon Rod				Snap Net	Draft	Drift	Pole	Bag	Stake	Box or Crib	Gap, Eye or Basket for Eels	Long lines for eels	Loop Net	Eel Trap	Special Long line	Head Weir	Special Local Licences
	For one year (£2)	For 14 days (£1)	Issuable @ £1 from 1st July onwards	Endorsement or Extension														
Dublin ...	311	1	66	13	—	11	16	—	—	—	—	—	—	—	—	—	—	—
Wexford ...	235	78	86	85	—	96	—	1	—	—	—	—	—	—	—	—	—	—
Waterford ...	865	28	60	44	101	15	73	—	1	2	3	8	—	—	—	—	1	—
Lismore ...	548	—	—	80	16	12	58	—	2	1	—	—	—	—	—	—	—	—
Cork ...	488	35	137	40	—	59	31	—	—	—	—	—	—	—	—	—	—	—
Kerry ...	564	461	—	98	1	56	—	—	1	—	3	—	—	—	—	—	—	—
Limerick ...	944	5	81	127	—	89	64	—	—	4	4	54	26	—	—	—	—	—
Galway ...	91	42	171	17	—	7	—	—	—	—	5	20	6	—	—	—	—	—
Connemara	91	340	—	141	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Ballinakill ...	34	39	153	73	—	10	—	—	—	—	—	—	—	—	—	—	—	—
Bangor ...	159	244	—	84	—	31	2	—	4	—	—	1	—	—	—	—	—	—
Ballina ...	197	95	54	71	—	12	37	—	—	—	7	43	5	—	—	—	—	—
Sligo ...	150	4	—	7	—	6	3	—	1	—	—	—	2	—	—	—	—	—
Ballyshannon	129	32	—	84	—	54	3	—	—	—	1	6	—	—	2	—	—	—
Letterkenny	585	—	207	334	—	32	42	—	—	—	2	—	—	28	—	13	—	13
Drogheda ...	367	21	—	78	—	95	—	—	—	—	6	2	1	—	4	—	—	—
Dundalk ...	94	2	—	51	—	23	—	—	—	—	—	5	1	—	—	—	—	—
TOTALS ...	5,852	1,427	1,015	1,427	118	609	329	1	9	7	31	139	41	28	6	13	1	13

APPENDIX No. 18.

Licence Duty payable on the undermentioned fishing engines.

		£	s.	d.
On each	Salmon Rod (for full year in one District)	2	0	0
Do.	Salmon Rod (14 days licence issuable where Board of Conservators so resolves) ..	1	0	0
Do.	Salmon Rod (special licence available 1st July to end of season issuable where a Board of Conservators so resolves) ..	1	0	0
Do.	Salmon Rod (Endorsement, extending a current licence to another District) ..	0	10	0
Do.	Snap Net	2	10	0
Do.	Draft Net or Seine	4	0	0
Do.	Drift Net	3	0	0
Do.	Bag Net	10	0	0
Do.	Fly Net	30	0	0
Do.	Stake Net	30	0	0
Do.	Head Weir	6	0	0
Do.	Box or Crib	10	0	0
Do.	Gap, Eye, or Basket (in eel weir) ..	2	0	0
Do.	Long Line for Eels	2	0	0

On other engines the duty is as follows :—

Fishery District	Pole Net	Loop Net	Eel Trap	Special Local Licences	
				Rod	Draft Net
	£ s.	£ s.	£ s.	£ s.	£ s.
1. Dublin	2 0	—	—	—	—
2. Wexford	2 0	—	—	—	—
3. Waterford	2 0	—	—	—	—
4. Lismore	2 0	—	—	—	—
5. Cork	2 0	—	—	—	—
7. Kerry	2 0	—	—	—	—
8. Limerick	2 0	—	—	—	—
9[1]. Galway	2 0	—	15 0	—	—
9[2]. Connemara	2 0	—	—	—	—
10[1]. Ballinakill	2 0	—	—	—	—
10[2]. Bangor	2 0	—	—	—	—
11. Ballina	2 0	—	—	—	—
12. Sligo	2 0	—	—	—	—
13. Ballyshannon	2 0	—	2 0	*2 0	*40 0
14[1]. Letterkenny	2 0	0 10	—	—	‡12 10
				†2 0	†20 0
17[1]. Drogheda	2 0	0 10	2 0	—	—
17[2]. Dundalk	2 0	—	—	—	—

*River Erne Tidal Waters. †River Lackagh Tidal Waters.

‡River Owenea Tidal Waters.

APPENDIX No. 19.

PUBLIC INQUIRIES HELD DURING THE YEAR 1958.

Date of Inquiry	Where Held	Subject Matter	Decision taken after consideration of Report of Inquiry
12th and 13th March, 1958	Ballyshannon	Fishing for salmon in the River Erne and its lakes and tributaries.	Bye-Law made prohibiting all salmon fishing in the tidal waters of the River Erne and its tributary, Abbey River, upstream of mouth of River Erne. Order made revoking earlier Order which permitted E.S.B. to operate without a free gap the Cathaleen Falls fishing weir at Ballyshannon.
26th March, 1958 ...	Muine Bheag	Fishing in the River Barrow including the Canal, in the vicinity of the weirs at Muine Bheag.	Bye-Law made prohibiting fishing in the vicinity of specified weirs at Muine Bheag.
13th August, 1958 ...	Kilmeena, Co. Mayo.	Taking of oysters or oyster-brood in Clew Bay in the vicinity of Quinsheen, Co. Mayo.	Bye-Law made prohibiting the taking of oysters or oyster brood in a specified part of Clew Bay during the period 1st December, 1958 to 30th September, 1961.
17th and 18th September, 1958.	Tullow ...	Bait-fishing for salmon after 1st April; spinning for trout and the close season for fishing for trout in the River Slaney and its tributaries.	Bye-Law not made—consideration of proposals still proceeding.
24th September, 1958 ...	Westport	Operation of Galway and Mayo Escallop Bye-Law No. 470 which governed the close season for catching of escallops and their size limits.	Bye-Law made causing the season for taking of escallops to open on 17th December instead of 1st January.
25th September, 1958 ...	Roundstone		
25th September, 1958 ...	Carna		
26th September, 1958 ...	Lettermore		
4th December, 1958 ...	Cork	Fishing in River Lee from bridges and quays in Cork City.	Further investigation of the position to be carried out.

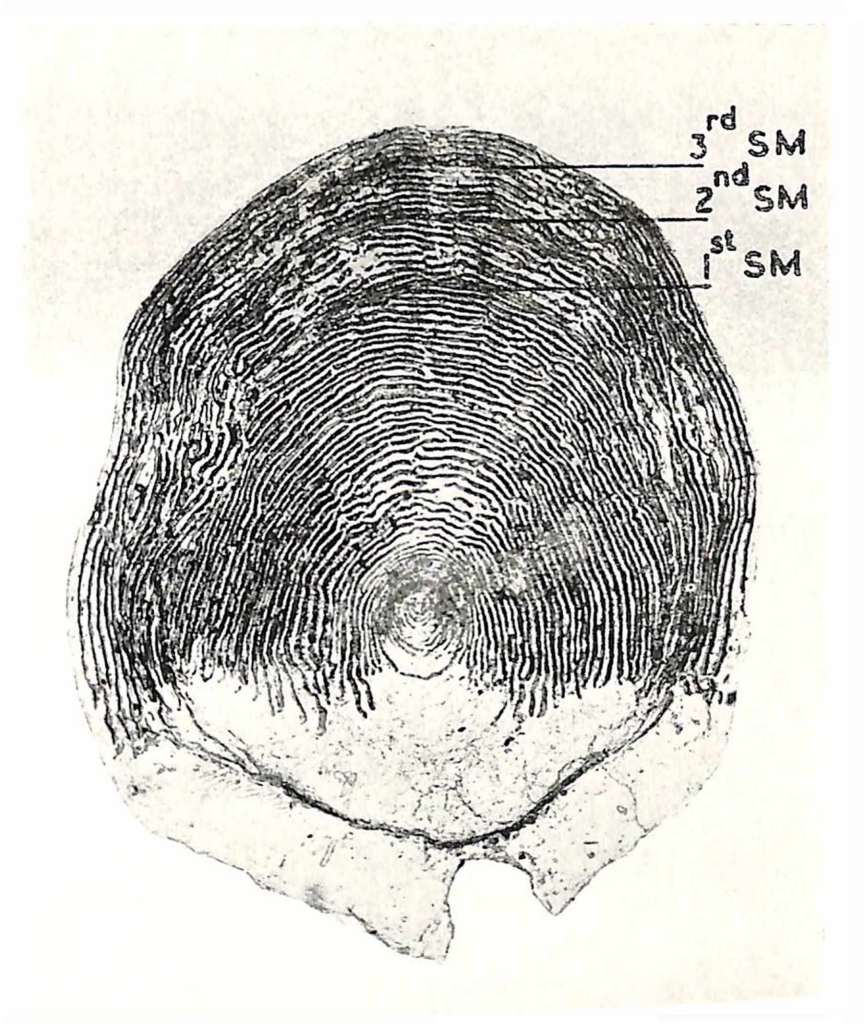

PLATE I. Photomicrograph of a scale of a previous spawner showing three spawning marks. (Weight 10½ lbs. Length 30·5 ins.)

APPENDIX No. 20.

ABSTRACT OF ORDERS, BYE-LAWS, ETC., MADE DURING THE YEAR 1958.

STATUTORY INSTRUMENTS.

(*a*) *Sea Fisheries.*

Fishing Nets (Regulation of Mesh) Order, 1954 (Amendment) Order, 1958, dated 1st April, 1958.

Permitting up to 4th April, 1961, the use of certain fishing nets having a smaller mesh than that specified in 1954.

Shellfish (Regulation of Export) Order, 1958, dated 15th November, 1958.

Prohibiting the export of shellfish, save under licence.

(*b*) *Inland Fisheries.*

Fishing Weir Operation (No. 1) Order, 1954 (Revocation) Order, 1958, dated 21st May, 1958.

Revoking the Fishing Weir Operation (No. 1) Order, 1954, (S.I. No. 55 of 1954) which authorised the Electricity Supply Board to operate without a free gap the fishing weir known as Cathaleen's Falls weir in Ballyshannon.

Fisheries (Amendment) Act, 1958 (Commencement) Order, 1958, dated 18th October, 1958.

Fixing operative dates for sections 23, 24, 28, 29 and 30 of the Fisheries (Amendment) Act, 1958.

Salmon Rod Ordinary Licences (Increase of Licence Duties) Order, 1958, dated 10th December, 1958.

Fixing the licence duties payable from 1st January, 1959, on all salmon rod ordinary licences (except salmon rod (seven day) ordinary licences).

Salmon Rod (Late Season) (District) Ordinary Licences Order, 1958, dated 10th December, 1958.

Authorising the boards of conservators named therein to issue, as from 1st January, 1959, salmon rod licences, for their districts covering the period from 1st July to the end of the fishing season.

River Lackagh (Special Local Licences) (Amendment) Order, 1958, dated 19th December, 1958.

Prescribing the licence duty payable for a special local licence to fish for salmon with rod and line in the tidal waters of the River Lackagh.

BYE-LAWS, ETC.

Galway District Bye-Law No. 494, 1958, dated 5th February, 1958.

Prohibiting the taking from Lough Corrib and Lough Mask of any trout of less than 10 inches in length.

Galway District Close Season Bye-Law No. C.S. 108, 1958, dated 5th February, 1958.

Prescribing close season dates for brown trout angling in the River Corrib, its lakes and tributaries (excluding Lough Corrib and Lough Mask).

Ballyshannon District Bye-Law No. 495, 1958, dated 3rd April, 1958.

Prohibiting salmon fishing in the tidal waters of the River Erne and of its tributary the Abbey River upstream of the mouth of the River Erne; and *Revoking* Ballyshannon District Netting Bye-Law No. 473 of 1950.

Limerick District Bye-Law No. 496, 1958, dated 15th July, 1958.

Prohibiting use of a gaff as auxiliary to fishing with rod and line in specified waters of Limerick fishery district.

Waterford District Bye-Law No. 497, 1958, dated 17th November, 1958.

Prohibiting fishing in a specified portion of the canal in the vicinity of Lodge Mills, Muine Bheag, Co. Carlow, and in the tail race of Lodge Mills discharging into the said canal.

Clew Bay Oyster Bye-Law No. 498, 1958, dated 24th November, 1958.

Prohibiting the taking of oysters or oyster brood from a specified portion of Clew Bay, during the period 15th December, 1958 to 30th September, 1961.

Galway and Mayo Escallop Bye-Law No. 499, 1958, dated 10th December, 1958.

Amending paragraph 5 of Galway and Mayo Escallop Bye-Law No. 470, 1949 by substituting "sixteenth day of December" for "thirty-first day of December," thus permitting the season for taking escallops to open on 17th December.

APPENDIX No. 21.

OUTPUT OF SALMON, TROUT AND BROWN TROUT OVA (IN THOUSANDS) AT THE VARIOUS HATCHERIES IN 1958.

Hatchery	River system stocked	Output in thousand ova		
		Salmon	Sea trout	Brown trout
Lismore ...	382,000 ova were distributed to hatching stations throughout the State, remainder to Blackwater	407	—	—
Mallow ...	Blackwater	670	—	—
Killarney ...	Laune	74	—	100
Parteen ...	Shannon	753	—	—
Lough Ennell	351,000 ova transferred to Inland Fisheries Trust Inc., remainder to Lough Ennell	—	—	451
Lough Owel ...	675,000 ova transferred to Inland Fisheries Trust Inc., remainder to Lough Owel ...	—	—	830
Spiddal ...	Spiddal	20	—	—
Oughterard ...	Corrib	—	—	347
Inver	Gowla	3	22	—
Screebe ...	Screebe	20	10	—
Ballisodare ...	Ballisodare	180	—	—
Ballyshannon	Erne	7	—	—
Glenties ...	813,000 salmon ova and all sea trout ova distributed to hatching stations throughout State, remainder to Owenea and Owentocker	1,135	65	—
TOTALS ...		3,269	97	1,728

APPENDIX No. 22.

LIST OF SCIENTIFIC PAPERS, ETC., BY OFFICERS OF THE FISHERIES DIVISION PUBLISHED DURING THE YEAR 1958. (OTHER THAN THOSE PUBLISHED IN THE ANNUAL REPORT.)

NEWMAN, HAZEL W. "Salmon of the River Lee, 1944 and 1945." *Proc. Roy. Irish Acad.*, 59. B. 5.

WENT, ARTHUR E. J. "Salmon movements around Ireland, viii. From drift nets along the coast of Co. Donegal." *Proc. Roy. Irish Acad.* 59. B. 10.

———— "Reflections on the 'List of fishes'." *Irish Nat. Jour.*, xii, 10. April, 1958.

———— "Salmon of the River Foyle, 1956." *Sixth Ann. Rep. Foyle Fish. Comm.*

———— "Sea trout of the River Foyle." *Ibid.*

———— with K. U. VICKERS. "Notes on the runs of fish into the River Foyle." *Ibid.*

APPENDIX No. 23.

SALMON OF THE RIVER CORRIB IN 1956, 1957 AND 1958

By

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INTRODUCTION.

The River Corrib is a short river, approximately 5 miles long, and together with its tributaries has a catchment area of 1,212 square miles. It forms the exit from Lough Corrib, a shallow lake having an area of 68 square miles, and empties itself into Galway Bay. The waters of the river are alkaline, having a normal p^H value of 7·9 to 8·0. A detailed account of the river system, its geological background and the chemical nature of its waters, has been given by Went (1943).

A very large percentage of the salmon killed in this river system are normally taken in a stretch of the river, less than 1 mile long, which is situated within the confines of Galway City. In this area there is a several fishery known as the Galway Fishery. Draft nets, weirs and rod and line are operated there for the capture of salmon. During the years 1956, 1957 and 1958 the weirs were in operation from February to July, inclusive. In 1956 four draft nets were operated from 9th April to 27th July; in 1957 three draft nets were operated from 1st May to 19th July and in 1958 four draft nets were operated from 27th May to 24th July. Rod fishing was carried on from 1st February to 30th September during each of these years.

The owners of the fishery, Messrs. H. Barber & Sons, Ltd., kindly undertook to collect sets of scales and relevant data from salmon captured in the fishery during the period in question and this investigation is based on that material.

Material and methods.—A total of 881 satisfactory sets of salmon scales, taken by nets, weirs and rod and line together with data relating to weight, length, sex and date of capture, were examined. The length of each fish, taken from the tip of the snout to the fork of the tail, was recorded to the nearest one-tenth of an inch and the weight to the nearest 2 ounces. Examination of the confidential returns of the fishery has shown that the percentage of fish sampled was adequate. There were, however, unavoidable fluctuations in the actual numbers of fish sampled, throughout the different months of the season, but to offset this the figures were adjusted by suitable arithmetical calculations and can be relied upon to give a fairly good picture of the incoming salmon populations.

Smolt ages and smolt types.—Three smolt classes were represented in the scale material (Tables 1 and 2). In each year about three-quarters of the fish migrated as two-year old smolts. Similar percentages were obtained by other workers on Irish salmon stocks (Went, 1943 ; O'Driscoll, 1950 ; Newman, 1958). The figures for the one-year old smolts were also of the same order as those recorded in other works. The percentage of three-year old smolts obtained was high but a similar high percentage (12·5%) was recorded previously from the River Corrib, during a survey of the salmon stocks of 1924, 1925 and 1926, by Went (1943), but the percentage in 1945 was only 6·2% (Went, 1947).

Two distinct types of smolts have been observed (Went, 1938). They are—(1) those with little or no growth rings laid down on the scales during the spring of the year in which they descended to the sea (*type A smolts*) and (2) those with a considerable number of growth rings laid down during this period (*type B smolts*). The proportion of the two smolt types in each smolt class has been given in Table III.

Age-groups.—The percentage frequency distributions of the different age-groups are given in Table IV. The scale samples were divided into four groups of maiden or unspawned fish and one group of previously spawned fish. This latter comprised all salmon with one or more spawning marks on their scales and the group is referred to by the term "with S.M.'s." The grilse (1 + winters) were the most important age-groups, forming 76·1%, 68·9% and 88·2% respectively, for the three years. Of the maiden fish the small spring fish (2 winters) were next in importance, while the large spring fish (3 winters) formed only a very minute percentage of the total catch. In 1957 10% of the total catch were small summer fish (2 + winters), but less than half that percentage was obtained in 1956 and 1958.

The peak of the grilse run was in June in 1956 and 1957 but was delayed until July in 1958 (Table 5). The peak of the spring fish run fluctuated between April and May while the peak of the small summer fish run was in May during all three seasons. Up to and including the month of April small spring fish predominated (Table 6). In May, 1956 and 1958 the small summer fish and grilse, together, formed almost 80% of the catch for that month, while in May, 1957 the small spring fish were the most important age-group. From June onwards grilse predominated. The average ratio of summer fish to spring fish, for the three years, was approximately 9 : 1 (Table 7). The small spring fish were, however, more important commercially than would appear from the actual numbers taken. Table 8 which gives a comparison of the catches numerically and by weight, illustrates this point.

Previous spawners formed about 10% of the total catch in 1956 and 1957 (Table 4). This is a higher percentage of previously spawned salmon than normally recorded from Irish rivers. It is not, however, the highest figure obtained for the

River Corrib, as in 1945 11·2% of the total catch of salmon, in that river, consisted of previously spawned fish (Went, 1947). The largest proportion of previous spawners was taken in July, the percentage varying from 73·8% in 1956 to 84·8% in 1958 (Table V). This has been found to be the case with other " grilse " rivers in Ireland.

Previously spawned salmon may be divided into three groups on the basis of the time spent feeding in the sea between successive spawning migrations. This is known as the *absence habit*. The term *short absence* habit denotes less than a full year spent feeding in the sea, *long absence* habit one full year and *very long absence* more than one full year. As is to be expected, the spring fish showed the long absence habit and the grilse either the short or very long absence habit (Table 9). Five fish had two spawning marks on their scales. Two of these had originally spawned as grilse and showed the short absence habit, while the remaining three had spawned as spring fish, and showed the long absence habit. One fish (0·2%) (Wt. 10·5 lbs., Lt. 30·5 ins.) had three spawning marks on its scales. It had originally spawned as a grilse in 1955 and when captured was returning to spawn for the fourth successive time (Plate I). Such fish are rare in Irish waters. Only five have been recorded previously, three from the River Erne (Went, 1947, 1951), one from the River Inny (Went, 1948) and one from the River Moy (Twomey, 1958).

Divided migration and return.—Table 10 gives the years in which the fish examined were hatched. Fish in their fourth year of life which had spent two years in the river and more than one full year in the sea formed the largest percentage of the total stocks in each year.

Size distribution.—The bulk of the fish (75·2% in 1956, 68·7% in 1957 and 86·0% in 1958) had lengths between 19·95 and 27·95 ins. (Fig. 1). The predominance of this length group is consistent with the predominance of grilse in the catches.

Sex ratio and size differentiation in the sexes.—The sex was determined by visual observation only and as this method is known to be subject to some inaccuracy, undue importance should not be attached to the figures in Table 11. They do, however, give an indication of the proportion of the sexes. The average sex ratio for the three years gave a proportion of 1 : 1·1 females to males although there was a slight majority of females in 1956 and males in 1957 and 1958. The size variation in the sexes is shown in Table 12 and, in general, it may be said that those described as males were slightly heavier and larger fish than those described as females.

Condition coefficient.—The condition coefficient (K) is the weight length relationship and may be determined by using the

following formula : $K = 105W/36L3$, where W = weight in pounds and L = length in inches. This formula was devised by Menzies (1922) and gave a figure approximating to unity for normally fed fish in the Scottish Dee. As the condition of the fish improves the figure becomes greater and may vary from 0·8 in the case of a poorly fed fish to 1·3 in the case of an exceptionally fat specimen. Table 13 gives the average monthly condition coefficient in the various age-groups. The spring fish were in better condition than the summer fish. Similar findings were described during the previous survey of the River Corrib and also in the Rivers Erne and Waterville (Went, 1942, 1943). The average condition coefficient for all fish was 1·10. This figure is slightly lower than that obtained for many other Irish Rivers already investigated (Twomey, 1958 ; Went, 1941, 1956).

Average sizes.—All the details relating to weight, length and condition coefficient, together with the minimum, mean and maximum sizes and dates of capture, are given in Tables 14 and 15.

Erosion.—Erosion is the name given to the phenomenon of the absorption of the scales of a salmon which occurs during the period of preparation for spawning. It commences and keeps pace with the development of the reproductive organs. Erosion usually begins in fresh water but if for some reason or other a salmon is prevented from entering fresh water erosion can commence in the sea. Table 16 gives the percentage of fish having eroded scales showing that more fish showed erosion in 1956 and 1957 than in 1958. All fish captured in August and September were taken by rod and line, hence the high percentage of fish with eroded scales recorded for these two months is not surprising.

Calculated lengths.—The length of each fish, at the end of every winter of river and sea life, was calculated on the assumption that the growth of the fish is directly proportional to the growth of the scales. In this manner data relating to lengths was obtained for 800 fish with satisfactory sets of scales and the details are given in Tables 17 to 21. From Table 17 it will be obvious that the average smolt length increases with the increase in the age of the smolt and that the fastest growing fish migrate first. This is consistent with the findings of other workers on Irish salmon. In Table 18 the three smolt classes have been divided into types A and B, showing that the type A smolts were on the average longer than the type B smolts, of the same smolt class, at the end of each year in fresh water. However, the average length of the type A smolts was generally slightly less than the average length of the type B smolts of the same smolt class.

Among the scales examined, a number were observed showing unusually large smolt growth particularly among the two and three year smolt classes. The calculated smolt lengths varied

from 6·9 to 9·9 ins. and the fish in question formed approximately six per cent. of the scales examined. The occurrence of these scales was of interest because similar scales were recorded from the Corrib system by Went (1943). He pointed out that the presence of such scales suggested that there were certain conditions in some limited part of the Corrib system which produced large smolts and that this possibility was not difficult to conceive in the case of the Corrib system where a wide variety of tributaries of diverse character exist.

The details of the various lengths at the end of each winter of sea life are shown in Tables 19, 20 and 21. The average length of all fish at the end of the first sea winter was slightly longer in 1958 than in either of the previous two seasons (Table 20). The average growth increment of the grilse in the final summer at sea ranged from 4·3 to 5·9 ins. and the average growth increment of the small summer fish from 1·5 to 2·9 ins. (Table 21).

The relationships between the smolt lengths and the lengths at the end of the different winters of sea life were calculated and it was found that generally the larger smolts tended to give rise to fish which in subsequent years were larger than average. The material upon which this statement is based is not reproduced because of its volume.

Resumé.

(1) This paper deals with an investigation of the salmon of the River Corrib in 1956, 1957 and 1958.

(2) The survey was based on the examination of 881 satisfactory sets of scales and data relating to weight, length, sex and date of capture.

(3) Three smolt classes were represented in the scale material. In each year approximately three-quarters of the fish migrated as two-year old smolts. The percentage of three-year old smolts was high, the average figure for the three years being 11·5% (Table 1).

(4) The grilse (one + winters) were the most important age-group of fish present, forming 76·1%, 68·9% and 88·2% of the total catch for the years 1956, 1957 and 1958, respectively (Table 4). The small spring fish were next in importance. Approximately 10% of the total catch in 1956 and in 1957 was formed of previously spawned fish but the figure fell to 4·6 in 1958 (Table 6). One fish had three spawning marks on its scales (Plate 1).

(5) Fish in their fourth year of life. which had spent two years in the river and more than one full year in the sea, formed the largest percentage of the total catch in each year (Table 10).

(6) The bulk of the fish (75·2% in 1956, 68·7% in 1957 and 86·0% in 1958) had lengths between 19·95 and 27·95 ins. (Fig. 1).

(7) The average sex ratio for the two years gave a proportion of 1 : 1·1 females : males (Table 11).

(8) The average condition coefficient was 1·10 (Table 13) showing that, while the fish were in good condition, they were more slender than the salmon of some other Irish rivers investigated to date (see references).

(9) A higher percentage of fish having eroded scales was recorded in 1956 and 1957 than in 1958 (Table 16).

(10) The length of each fish at the end of every winter of river and sea life was calculated. The average smolt length increased with the increase in the age of the smolt and the fastest growing fish migrated first (Table 17). The average length of the type A smolts was slightly less than the average length of the type B smolts of the same smolt class (Table 18).

(11) A number of the scales examined (six per cent. of the total number) showed unusually large smolt growth.

(12) The relationships between the smolt lengths and the lengths at the end of the different winters of sea life were calculated and it was found that generally the larger smolts tended to give rise to fish which in subsequent years were larger than average. The material upon which this statement is based is not reproduced because of its volume.

ACKNOWLEDGMENTS.

I am indebted to Dr. A. E. J. Went, Inspector and Scientific Adviser, Fisheries Division, Department of Lands, Dublin, for his helpful suggestions in the presentation of this paper and for reading through the MSS. I also wish to thank the owners of the Galway Fishery, Messrs. H. Barber & Son, Limited, who kindly collected the material upon which this paper is based.

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TABLE 1.—The percentage of each smolt age in each age-group.

Smolt class	Age-groups (in winters)					
	1+	2	2+	3	with S.M.'s	Total maiden fish
			1956			
1 ...	17·2	17·0	25·0	53·5	20·4	17·8
2 ...	73·3	72·3	64·6	46·5	75·7	72·6
3 ...	9·5	10·7	10·4	—	3·9	9·6
Total	100·0	100·0	100·0	100·0	100·0	100·0
			1957			
1 ...	5·0	17·6	29·4	17·6	24·3	9·3
2 ...	80·2	73·5	66·2	82·4	65·9	77·8
3 ...	14·8	8·9	4·4	—	9·8	12·9
Total	100·0	100·0	100·0	100·0	100·0	100·0
			1958			
1 ...	8·8	15·1	8·5	100·0	21·5	9·8
2 ...	78·4	72·9	82·1	—	77·2	78·1
3 ...	12·8	12·0	9·4	—	1·3	12·1
Total	100·0	100·0	100·0	100·0	100·0	100·0

TABLE 2.—Monthly changes in the percentage of one-year smolts in the different age-groups.

	1956 Age-groups (in winters)						1957 Age-groups (in winters)						1958 Age-groups (in winters)					
	1 –	2	2 –	3	With S.M.'s	Total for maiden fish	1 –	2	2 –	3	With S.M.'s	Total for maiden fish	1 –	2	2 –	3	With S.M.'s	Total for maiden fish
Feb./Mar.	—	10·7	—	*33·3*	*10·0*	12·9	—	16·2	—	*33·3*	—	17·2	—	23·2	—	*100·0*	*15·8*	26·1
April ...	—	15·1	*50·0*	*100·0*	*67·5*	20·3	—	22·2	*22·5*	—	—	21·8	—	*7·6*	—	—	—	5·6
May ...	*5·1*	*28·6*	22·7	—	—	17·3	*33·3*	16·1	26·6	—	—	25·1	—	*19·8*	*14·1*	—	*100·0*	8·1
June ...	12·5	—	—	—	*50·0*	12·5	—	—	*24·2*	—	—	2·0	—	—	—	—	—	—
July ...	24·9	—	—	—	*10·0*	24·9	10·0	—	—	—	*30·0*	10·0	16·7	—	—	—	*19·8*	16·7
August ...	15·8	—	—	—	—	15·8	—	—	—	—	—	—	—	—	—	—	—	—
September	11·1	—	*62·5*	—	—	16·3	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL ...	17·2	17·0	25·0	53·5	20·4	17·8	5·0	17·6	29·4	17·6	24·3	9·3	8·8	15·1	8·5	100·0	21·5	9·8

The figures in italics are derived from a small number of observations.

TABLE 3.—The estimated percentages of the different smolt types in each smolt class for maiden fish only.

Smolt age	Type A	Type B
	1956	
One year ...	—	17·8 (51)
Two years ...	15·3 (42)	57·3 (165)
Three years	7·7 (39)	1·9 (7)
Total	21·9 (81)	78·1 (223)
	1957	
One year ...	—	9·3 (36)
Two years ...	19·5 (36)	58·3 (137)
Three years	11·2 (23)	1·7 (7)
Total	28·4 (59)	71· (180)
	1958	
One year ...	—	9·2 (32)
Two years ...	29 7 (78)	48·5 (130)
Three years	12·4 (29)	0·2 (3)
Total	42·1 (107)	57·9 (165)

TABLE 4.—The estimated monthly catch in each age-group as percentage of the yearly total.

Month	Age-groups (in winters)					
	1	2	2+	3	With S.M.'s	Total
			1956			
Feb./Mar.	—	2·8	—	0·3	0·7	3·8
April	—	3·5	0·26	0·1	0·4	4·3
May	3·9	2·1	4·4	—	—	10·4
June	38·3	—	—	—	1·6	39·9
July	30·5	—	—	—	7·6	38·1
August	1·9	—	—	—	—	1·9
September	1·5	—	0·16	—	—	1·6
Total	76·1	8·4	4·8	0·4	10·3	100·0
			1957			
Feb./Mar.	—	1·4	—	0·1	0·1	1·6
April	—	2·8	0·7	0·1	0·3	3·9
May	0·8	7·1	5·7	—	0·6	14·2
June	36·2	—	3·3	—	0·8	40·3
July	31·2	—	—	—	7·8	39·0
August	0·7	—	0·3	—	—	1·0
Total	68·9	11·3	10·0	0·2	9·6	100·0
			1958			
Feb./Mar.	—	1·5	—	0·1	0·2	1·8
April	—	2·5	0·9	—	0·3	3·7
May	2·5	0·9	1·3	—	0·2	4·9
June	38·9	—	—	—	—	38·9
July	46·8	—	—	—	3·9	50·7
Total	88·2	4·9	2·2	0·1	4·6	100·0

TABLE 5.—The estimated percentage of the total of each age-group in each month.

Month	Age-groups (in winters)					
	1	2	2 -	3	With S.M.'s	Total
			1956			
Feb./Mar.	—	33·3	—	69·8	6·8	3·8
April	—	41·8	5·4	30·2	3·9	4·3
May	5·1	24·9	91·3	—	—	10·4
June	50·4	—	—	—	15·5	39·9
July	40·1	—	—	—	73·8	38·1
August	2·5	—	—	—	—	1·9
September	1·9	—	3·3	—	—	1·6
Total	100·0	100·0	100·0	100·0	100·0	100·0
			1957			
Feb./Mar.	—	12·1	—	52·9	1·5	1·6
April	—	25·1	7·1	47·1	3·2	3·9
May	1·2	62·8	56·6	—	5·9	14·2
June	52·6	—	32·9	—	8·3	40·3
July	45·2	—	—	—	81·1	39·6
August	1·0	—	3·4	—	—	1·0
Total	100·0	100·0	100·0	100·0	100·0	100·0
			1958			
Feb./Mar.	—	31·6	—	100·0	4·1	1·8
April	—	50·8	39·7	—	7·0	3·7
May	2·8	17·6	60·3	—	4·1	4·9
June	44·1	—	—	—	—	38·9
July	53·1	—	—	—	84·8	50·7
Total	100·0	100·0	100·0	100·0	100·0	100·0

TABLE 6.—The estimated percentage of each age-group in the catch of each month.

Month	Age-groups (in winters)					
	1+	2	2+	3	With S.M.'s	Total
			1956			
Feb./Mar.	—	73·7	—	7·9	18·4	100·0
April	—	81·6	6·1	3·0	9·3	100·0
May	37·5	20·2	42·3	—	—	100·0
June	96·0	—	—	—	4·0	100·0
July	80·1	—	—	—	19·9	100·0
August	100·0	—	—	—	—	100·0
September	90·0	—	10·0	—	—	100·0
Total ...	76·1	8·4	4·8	0·4	10·3	100·0
			1957			
Feb./Mar.	—	85·5	—	5·7	8·8	100·0
April	—	72·1	18·0	2·0	7·9	100·0
May	5·9	50·1	40·0	—	4·0	100·0
June	89·8	—	8·2	—	2·0	100·0
July	80·1	—	—	—	19·9	100·0
August	67·0	—	33·0	—	—	100·0
Total ...	68·9	11·3	10·0	0·2	9·6	100·0
			1958			
Feb./Mar.	—	86·1	—	3·3	10·6	100·0
April	—	67·3	24·1	—	8·6	100·0
May	51·0	17·5	27·6	—	3·9	100·0
June	100·0	—	—	—	—	100·0
July	92·3	—	—	—	7·7	100·0
Total ...	88·2	4·9	2·2	0·1	4·6	100·0

TABLE 7.—The percentage of spring and summer fish in the catch of each month.

Month	1956		1957		1958	
	Spring fish	Summer fish	Spring fish	Summer fish	Spring fish	Summer fish
Feb./Mar.	100·0	—	100·0	—	100·0	—
April	90·9	9·1	80·4	19·6	75·9	24·1
May	20·2	79·8	52·2	47·8	21·4	78·6
June	—	100·0	—	100·0	—	100·0
July	—	100·0	—	100·0	—	100·0
August	—	100·0	—	100·0	—	—
September	—	100·0	—	—	—	—
Total ...	9·8	90·2	12·7	87·3	8·9	91·1

TABLE 8.—The percentage composition of the catches numerically and by weight.

Age-groups (in winters)	Percentage of catch numerically	Percentage of catch by weight
	1956	
1+	76·1	61·2
2	8·4	11·9
2+	4·8	8·1
3	0·4	1·1
With S.M.'s	10·3	17·7
Total	100·0	100·0
	1957	
1+	68·9	53·9
2	11·3	15·4
2+	10·0	15·9
3	0·2	0·6
With S.M.'s	9·6	14·2
Total ...	100·0	100·0
	1958	
1+	88·2	74·8
2	4·9	8·0
2+	2·2	4·2
3	0·1	2·6
With S.M.'s	4·6	10·4
Total	100·0	100·0

TABLE 9.—The absence habit of previously spawned fish.

Absence habit	1956				1957			1958			
	Age at first spawning (in winters)				Age at first spawning (in winters)			Age at first spawning (in winters)			
	1	2	2+	Total	1	2	Total	1	2	3	Total
Short	10	—	1	11	11	—	11	5	—	—	5
Long	—	12	—	13*	—	9	10*	—	9	1	14*
Very long ...	1	—	—	1	1	—	1	—	—	—	—
Total ...	11	12	1	25	12	9	22	5	9	1	19

*Including fish the age of first spawning of which could not be determined.

TABLE 10.—Divided migration and return—a table showing the years in which the fish examined were hatched as percentages of the total of the year's catch.

	Hatched in the year							
	1948	1949	1950	1951	1952	1953	1954	Total
Returned in 1956 as :—								
Grilse	—	—	—	—	7·3	55·7	13·1	76·1
Small spring fish	—	—	—	0·9	6·1	1·4	—	8·4
Small summer fish	—	—	—	0·5	3·1	1·2	—	4·8
Large spring fish	—	—	—	0·2	0·2	—	—	0·4
Previous spawners	0·8	0·4	2·9	1·2	4·6	0·4	—	10·3
Total ...	0·8	0·4	2·9	2·8	21·3	58·7	13·1	100·0

	Hatched in the year							
		1950	1951	1952	1953	1954	1955	Total
Returned in 1957 as :—								
Grilse	...	—	—	—	10·2	55·3	3·4	68·9
Small spring fish	...	—	—	1·0	8·3	2·0	—	11·3
Small summer fish	...	—	—	0·4	6·6	3·0	—	10·0
Large spring fish	...	—	—	0·14	0·03	—	—	0·2
Previous spawners	...	1·9	2·5	0·8	3·1	1·3	—	9·6
Total ...	...	1·9	2·5	2·4	28·2	61·6	3·4	100·0

	Hatched in the year							
	1949	1951	1952	1953	1954	1955	1956	Total
Returned in 1958 as :—								
Grilse	—	—	—	—	11·2	69·2	7·8	88·2
Small spring fish	—	—	—	0·6	3·6	0·7	—	4·9
Small summer fish	—	—	—	0·2	1·8	0·2	—	2·2
Large spring fish	—	—	—	—	0·1	—	—	0·1
Previous spawners	0·2	0·2	2·5	0·8	0·5	0·2	—	4·6*
Total ...	0·2	0·2	2·5	1·6	17·2	70·3	7·8	100·0

*Including one fish the age of first spawning of which could not be determined.

TABLE 11.—The percentage of females in each age-group (sex determined by visual observation).

Year	Age-groups (in winters)				
	1+	2	2+	3	Total
1956 ...	56	62	25	60	54
1957 ...	38	55	40	50	46
1958 ...	43	41	39	50	42

TABLE 12.—The average weights and lengths for males and females in the more important age-groups.

Age-groups	Males		Females	
	Weight in lbs.	Length in ins.	Weight in lbs.	Length in ins.
		1956		
Grilse (1+ winters) ...	6·8	25·9	5·6	24·4
Small spring fish(2 winters)	11·7	30·7	10·4	29·4
Small summer fish (2+ winters)	13·7	32·1	11·3	30·8
		1957		
Grilse (1+ winters) ...	6·4	25·3	6·1	24·0
Small spring fish (2 winters)	11·8	30·0	10·4	29·9
Small summer fish (2+ winters)	14·2	32·6	11·0	30·0
		1958		
Grilse (1+ winters) ...	6·2	25·3	5·3	24·1
Small spring fish (2 winters)	11·5	30·0	10·7	29·4
Small summer fish (2+ winters)	13·7	31·9	11·8	30·5

TABLE 13.—The average monthly condition coefficients (K.) in the various age-groups.

	1956 Age-groups (in winters)					1957 Age-groups (in winters)					1958 Age-groups (in winters)				
	1+	2	2+	3	With S.M.'s	1+	2	2+	3	With S.M.'s	1+	2	2+	3	With S.M.'s
Feb./Mar.	—	1·13	—	1·20	1·15	—	1·12	—	1·11	1·09	—	1·16	—	1·19	1·16
April	—	1·10	1·19	1·18	1·16	—	1·11	1·17	1·11	1·09	—	1·19	1·15	—	1·17
May	1·03	1·05	1·12	—	—	0·97	1·08	1·13	—	1·17	1·00	1·08	1·13	—	1·03
June	1·11	—	—	—	1·11	1·08	—	1·04	—	1·01	1·02	—	—	—	—
July	1·07	—	—	—	1·13	1·11	—	—	—	1·08	1·06	—	—	—	1·06
August	1·04	—	—	—	—	1·04	—	1·08	—	—	—	—	—	—	—
September	1·03	—	1·02	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	1·06	1·11	1·14	1·19	1·14	1·09	1·12	1·13	1·13	1·09	1·04	1·16	1·14	1·19	1·12
Spring fish			1·11					1·12					1·16		
Summer fish			1·07					1·09					1·06		

TABLE 14.—The minimum, average and maximum sizes in the different age-groups.

(1) GRILSE (1+ WINTERS)

	1956			1957			1958		
	Number examined = 193			Number examined = 90			Number examined = 138		
	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture
Minimum	3·5	22·0	29 August	2·5	19·0	15 July	2·5	20·0	5 June
Average ...	6·2	25·3	—	6·3	25·1	—	5·8	24·8	—
Maximum	11·0	29·5	20 July	10·5 9·5	28·5 29·5	2 July 19 July	10·75	29·5	16 July

(2) SMALL SPRING FISH (2 WINTERS)

	1956			1957			1958		
	Number examined = 78			Number examined = 110			Number examined = 104		
	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture
Minimum	7·0	26·0	17 Feb.	7·5 7·25	27·0 27·25	25 March 9 May	7·5	26·0	5 May
Average ...	10·9	29·9	—	11·1	29·9	—	11·2	29·8	—
Maximum	19·5	34·5	19 April	19·5	35·5	1 April	19·5	35·0	18 April

TABLE 14.—The minimum, average and maximum sizes in the different age-groups——*continued.*

(3) SMALL SUMMER FISH (2½ WINTERS)

	1956			1957			1958		
	Number examined = 28			Number examined = 35			Number examined = 28		
	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture
Minimum	8·5	29·5	7 May	8·25	27·5	21 June	4·5	24·75	29 May
Average	13·1	31·6	—	12·9	31·5	—	13·0	31·4	—
Maximum	18·0	36·5	5 May	22·5	38·0	20 May	21·75	36·5	25 April

(4) LARGE SPRING FISH (3 WINTERS)

	1956			1957			1958		
	Number examined = 5			Number examined = 4			Number examined = 2		
	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture
Minimum	13·25	31·5	2 March	17·0 17·5	35·5 35·0	7 March 15 March	16·0	33·5	28 March
Average	19·3	35·2	—	19·5	36·2	—	17·7	34·5	—
Maximum	29·0	40·0	28 March	25·5	39·0	16 March	19·5	35·5	31 March

TABLE 14.—The minimum, average and maximum sizes in the different age-groups——*continued.*——

(5) PREVIOUS SPAWNERS (WITH S.M.'s)

	1956			1957			1958		
	Number examined = 25			Number examined = 22			Number examined = 19		
	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture	lbs.	ins.	Date of capture
Minimum	6·0 6·25	26·0 25·0	18 July 17 July	5·75	25·0	22 July	5·0	24·75	16 July
Average	13·3	31·6	—	12·0	30·9	—	15·4	33·1	—
Maximum	21·0	38·0	30 March	22·0	37·0	15 May	27·0	41·0	28 Feb.

TABLE 15.—The average sizes in the different age-groups and smolt classes.

GRILSE (1 sea winter)

Smolt age :	1			2			3		
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
					1956				
May	4·8	22·3	1·20	5·6	24·6	1·03	5·0	24·0	0·99
June	6·0	25·6	1·21	6·5	25·3	1·11	5·0	23·5	1·07
July	6·6	25·4	1·10	6·2	25·1	1·07	5·4	24·4	1·03
August	6·2	25·0	1·17	6·1	25·1	1·02	6·4	25·4	1·08
September	5·6	24·1	1·11	5·9	25·1	1·02	6·6	26·0	1·02
Total	6·2	25·1	1·11	6·1	25·1	1·06	6·4	25·1	1·04
					1957				
May	4·5	23·5	0·96	4·5	23·5	0·96	5·5	25·0	0·97
June	—	—	—	5·8	23·6	1·08	5·8	24·5	1·07
July	5·1	23·3	1·07	6·9	28·5	1·11	6·8	25·9	1·09
August	—	—	—	7·6	26·9	1·04	—	—	—
Total	5·0	23·3	1·05	6·4	25·3	1·09	6·0	24·9	1·07
					1958				
May	—	—	—	5·7	24·9	1·01	5·8	24·7	1·11
June	—	—	—	5·8	24·6	1·02	5·4	24·4	1·02
July	6·6	25·4	1·10	6·0	24·9	1·06	5·6	24·6	1·02
Total	6·6	25·4	1·10	5·7	24·8	1·03	5·6	24·6	1·01

ALL SMOLTS

	1956			1957			1958	
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
May	5·4	24·3	1·03	4·8	24·0	0·97	5·7	24·9	1·00
June	6·5	25·3	1·11	5·8	24·5	1·08	5·5	24·5	1·02
July	6·2	25·2	1·07	6·8	25·6	1·11	6·1	24·9	1·06
August	6·2	25·3	1·04	7·6	26·9	1·04	—	—	—
September	6·0	25·2	1·03	—	—	—	—	—	—
Total	6·2	25·3	1·06	6·3	25·1	1·09	5·8	24·8	1·04

SMALL SPRING FISH (2 WINTERS)

Smolt age :	1			2			3		
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
					1956				
Feb./Mar.	9·6	29·5	1·14	11·3	30·0	1·15	10·5	30·1	1·06
April	10·6	29·9	1·10	11·1	30·0	1·10	8·0	27·6	1·05
May	9·8	29·0	1·08	11·1	30·0	1·01	—	—	—
Total	9·8	29·1	1·11	11·2	30·0	1·11	10·0	29·6	1·05

Small Spring Fish (2 winters)—*continued*

1957

Feb./Mar.	10·2	29·2	1·10	10·3	29·3	1·12	12·0	29·7	1·12
April ...	12·3	30·7	1·17	11·8	30·5	1·13	12·9	31·3	1·17
May ...	11·3	30·6	1·09	10·7	30·1	1·07	11·8	30·4	1·17
Total	11·3	30·1	1·13	10·9	29·9	1·11	12·5	30·1	1·15

1958

Feb./Mar.	10·7	29·5	1·15	10·6	29·3	1·15	12·1	30·2	1·21
April ...	15·8	32·7	1·24	12·2	30·6	1·18	12·3	30·9	1·15
May ...	10·3	30·0	1·08	9·9	29·1	1·10	9·6	29·5	1·03
Total	11·6	30·2	1·16	11·0	29·6	1·16	11·4	30·1	1·15

All Smolts

	1956			1957			1958		
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
Feb./Mar.	11·0	29·9	1·13	10·5	29·4	1·12	10·7	29·4	1·16
April ...	10·8	29·8	1·10	11·9	30·6	1·14	12·1	30·4	1·19
May ...	10·7	30·2	1·05	10·9	30·2	1·08	9·9	29·3	1·08
Total	10·9	29·9	1·11	11·1	29·9	1·12	11·2	29·8	1·16

Small Summer Fish (2+ winters)

Smolt age :	1			2			3		
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
					1956				
April ...	13·3	31·0	1·28	12·3	31·5	1·09	—	—	—
May ...	12·7	31·6	1·10	13·7	31·6	1·12	15·3	33·4	1·14
September	11·0	31·0	1·01	10·9	31·0	1·03	—	—	—
Total	12·2	31·3	1·09	13·3	31·3	1·10	15·3	33·4	1·14

Small Summer Fish (2+ winters)—*contd.*

Smolt age :	1			2			3		
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
					1957				
April ...	12·6	31·6	1·11	13·2	31·2	1·18	11·4	29·6	1·21
May ...	14·9	33·1	1·11	12·8	31·3	1·15	9·0	28·0	1·14
June ...	8·3	27·5	1·11	10·5	30·7	1·02	—	—	—
August ...	—	—	—	16·0	34·5	1·08	—	—	—
Total	13·8	32·3	1·11	12·8	31·5	1·13	10·6	29·1	1·18
					1958				
April ...	—	—	—	13·2	31·6	1·15	11·0	29·5	1·18
May ...	16·3	33·5	1·20	12·9	31·3	1·13	8·0	28·5	1·02
Total	16·3	33·5	1·20	13·1	31·4	1·14	10·0	29·2	1·16

ALL SMOLTS

	1956			1957			1958	
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
April ...	12·8	31·3	1·19	12·6	30·9	1·17	12·9	31·3	1·15
May ...	13·6	31·8	1·12	13·4	31·8	1·13	13·0	31·4	1·13
June ...	—	—	—	9·9	29·9	1·04	—	—	—
August ...	—	—	—	16·0	34·5	1·08	—	—	—
September	10·9	31·0	1·02	—	—	—	—	—	—
Total	13·1	31·6	1·14	12·9	31·5	1·13	13·0	31·4	1·14

LARGE SPRING FISH (3 WINTERS)

Smolt age :	1			2			3		
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
					1956				
Feb./Mar.	13·3	31·5	1·19	22·0	36·7	1·21	—	—	—
April ...	17·5	34·5	1·18	—	—	—	—	—	—
Total	15·4	33·0	1·18	22·0	36·7	1·21	—	—	—

LARGE SPRING FISH (3 WINTERS)—*contd.*

Smolt age :	1			2			3		
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
					1957				
Feb./Mar.	17·0	35·0	1·10	21·5	37·0	1·17	—	—	—
April ...	—	—	—	18·0	35·5	1·11	—	—	—
Total	17·0	35·0	1·10	20·3	36·5	1·15	—	—	—
					1958				
Feb./Mar.	17·7	34·5	1·19	—	—	—	—	—	—
Total	17·7	34·5	1·19	—	—	—	—	—	—

ALL SMOLTS

	1956			1957			1958	
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
Feb./Mar.	19·8	35·4	1·20	20·0	36·3	1·14	17·7	34·5	1·19
April ...	17·5	34·5	1·18	18·0	35·5	1·11	—	—	—
Total	19·3	35·2	1·19	19·5	36·2	1·13	17·7	34·5	1·19

	Previous Spawners (with S.M.'s)								
	1956			1957			1958		
	lbs.	ins.	K.	lbs.	ins.	K.	lbs.	ins.	K.
Feb./Mar.	16·6	35·0	1·15	14·4	33·1	1·09	19·7	36·0	1·16
April ...	15·6	33·4	1·16	14·8	33·3	1·09	16·6	33·9	1·17
May ...	—	—	—	18·0	34·7	1·17	11·6	31·1	1·03
June ...	12·5	31·1	1·11	12·0	32·0	1·01	—	—	—
July ...	9·4	28·4	1·13	8·6	27·9	1·08	9·7	29·2	1·09
Total	13·3	31·6	1·14	12·9	30·9	1·09	15·4	33·1	1·12

TABLE 16.—The percentage of fish having eroded scales.

	Age groups (in winters)														
	1956					1957					1958				
	1+	2	2+	3	With S.M.'s	1+	2	2+	3	With S.M.'s	1+	2	2+	3	With S.M.'s
Feb./Mar.	—	0	—	0	0	—	0	—	33·3	0	—	0	—	0	0
April	—	3·8	0	100·0	0	—	5·6	0	0	0	—	0	0	—	0
May	0	10·1	4·8	—	—	0	8·0	4·9	—	0	0	22·1	0	—	0
June	0	—	—	—	0	0	—	0	—	0	0	—	—	—	—
July	14·9	—	—	—	0	10·1	—	—	—	0	6·9	—	—	—	0
August	75·8	—	—	—	—	100·0	—	100·0	—	—	—	—	—	—	—
September	100·0	—	100·0	—	—	—	—	—	—	—	—	—	—	—	—

TABLE 17.—The average calculated lengths of the three smolt classes at the end of each winter in fresh water.

Smolt age (in years)	No.	The average lengths in inches at the end of			Avorage smolt length in inches
		1st winter	2nd winter	3rd winter	
			1956		
1	49	2·9	—	—	5·3
2	199	1·8	4·9	—	5·9
3	45	1·6	3·8	6·0	6·2
			1957		
1	36	2·8	—	—	1·9
2	169	1·8	4·6	—	5·5
3	30	1·6	3·6	5·7	5·9
			1958		
1	32	2·3	—	—	3·9
2	208	1·7	4·6	—	5·4
3	32	1·5	3·3	5·4	5·5

TABLE 18.—The average calculated lengths of the different smolt types, in the three smolt classes, at the end of each winter in fresh water.

Smolt age (in years)	Type A Smolts				Type B Smolts				Mean smolt length in inches
	No.	Length in inches at the end of		Mean smolt length in inches	No.	Length in inches at the end of			
		1st winter	2nd winter	3rd winter		1st winter	2nd winter	3rd winter	
					1956				
1	—	—	—	—	—	49	2·9	—	—	5·3
2	42	1·9	5·9	—	5·9	157	1·7	4·4	—	5·9
3	38	1·7	3·8	6·1	6·1	7	1·5	3·5	5·3	6·4
					1957				
1	—	—	—	—	—	36	2·8	—	—	4·9
2	36	1·9	5·3	—	5·3	133	1·8	4·6	—	5·7
3	23	1·5	3·5	5·7	5·7	7	1·6	3·9	5·7	6·5
					1958				
1	—	—	—	—	—	32	2·3	—	—	3·9
2	78	1·8	5·2	—	5·2	130	1·6	4·3	—	5·4
3	29	1·5	3·4	5·5	5·5	3	1·2	2·6	4·7	6·1

TABLE 19.—The average calculated lengths at the end of each winter of River and Sea Life.

Age-group	No.	River Life: Length in inches at end of 1st winter	River Life: Length in inches at end of 2nd winter	River Life: Length in inches at end of 3rd winter	Average smolt length in inches	Sea Life: Length in inches at end of 1st winter	Sea Life: Length in inches at end of 2nd winter	Sea Life: Length in inches at end of 3rd winter	Average length at capture in inches
					1956				
1·1+ ...	28	3·1	—	—	5·4	18·7	—	—	25·1
2·1+ ...	125	1·7	4·8	—	5·9	19·6	—	—	26·4
3·1+ ...	33	1·6	3·7	5·9	6·1	19·6	—	—	25·7
1·2	12	1·6	—	—	5·1	17·8	29·1	—	29·1
2·2	56	1·8	5·1	—	6·1	19·4	30·1	—	30·1
3·2	10	1·8	4·2	6·5	6·9	20·2	29·6	—	29·6
1·2+ ...	7	2·4	—	—	5·1	17·7	29·4	—	31·3
2·2+ ...	15	1·8	3·9	—	5·9	18·2	29·5	—	31·6
3·2+ ...	2	2·0	3·5	5·0	5·0	19·8	32·0	—	33·4
1·3	2	3·4	—	—	5·2	17·8	27·7	33·0	33·0
2·3	3	2·3	6·2	—	6·5	19·3	30·1	36·7	36·7
					1957				
1·1+ ...	5	2·1	—	—	4·2	17·1	—	—	23·3
2·1+ ...	70	1·8	4·7	—	5·7	19·7	—	—	25·3
3·1+ ...	13	1·5	3·8	5·7	6·4	19·2	—	—	24·9
1·2	20	2·8	—	—	5·1	19·6	30·1	—	30·1
2·2	76	1·7	4·6	—	5·7	19·1	29·9	—	29·9
3·2	14	1·5	3·3	5·5	5·7	20·2	30·1	—	30·1
1·2+ ...	10	2·8	—	—	4·8	18·4	30·2	—	32·3
2·2+ ...	20	1·9	4·5	—	5·3	19·0	29·5	—	31·5
3·2+ ...	3	1·8	3·8	6·2	6·2	17·8	27·4	—	29·1
1·3	1	2·4	—	—	5·9	18·0	28·9	35·0	35·0
2·3	3	2·8	5·5	—	6·6	18·0	30·8	36·5	36·5
					1958				
1·1+ ...	10	2·2	—	—	4·0	19·6	—	—	25·4
2·1+ ...	109	1·6	4·9	—	5·5	20·3	—	—	24·8
3·1+ ...	19	1·4	3·3	5·4	5·6	20·0	—	—	24·6
1·2	18	2·4	—	—	3·9	20·2	30·2	—	30·2
2·2	76	1·7	4·3	—	5·2	19·9	29·6	—	29·6
3·2	10	1·6	3·4	5·3	5·5	20·0	30·1	—	30·1
1·2+ ...	2	2·0	—	—	3·4	19·1	31·6	—	33·5
2·2	23	2·0	4·6	—	5·1	19·6	29·7	—	31·4
3·2+ ...	3	1·7	3·3	5·3	5·3	18·3	28·0	—	29·2
1·3	2	2·2	—	—	3·7	20·6	28·0	34·5	34·5

TABLE 20.—The average calculated lengths at the end of each winter in the sea, together with the average smolt lengths.

Age-groups (in winters)	No.	Average smolt length	The average length in inches at the end of			Average length at capture
			1st Sea Winter	2nd Sea Winter	3rd Sea Winter	
			1956			
1—	186	5·9	19·3	—	—	25·3
2	78	5·4	19·2	29·9	—	29·9
2+	24	5·5	18·2	29·7	—	31·6
3	5	6·0	18·7	29·1	35·2	35·2
			1957			
1	88	5·7	19·5	—	—	25·1
2	110	5·6	19·2	29·9	—	29·9
2+	33	5·2	18·5	29·6	—	31·5
3	4	6·4	18·0	30·3	36·2	36·2
			1958			
1—	138	5·4	20·2	—	—	24·8
2	104	5·0	20·0	29·8	—	29·8
2+	28	5·0	19·4	29·7	—	31·4
3	2	3·7	20·6	28·0	34·5	34·5

TABLE 21.—The average growth increment in the final summer at sea for the grilse and small summer fish.

Month	Grilse		Small summer fish	
	Number examined	Average increment in inches	Number examined	Average increment in inches
		1956		
April	—	—	2	2·6
May	19	4·6	21	2·3
June	48	4·9	—	—
July	40	5·4	—	—
August	39	5·6	—	—
September	40	5·3	1	2·9
		1957		
April	—	—	9	1·8
May	3	4·3	30	2·4
June	42	4·8	4	2·3
July	40	5·9	—	—
August	3	5·8	—	—
		1958		
April	—	—	14	1·8
May	52	4·3	14	1·5
June	26	4·9	—	—
July	69	5·2	—	—

APPENDIX No. 24.

THE DUNMORE EAST HERRING FISHERY 1958/59

By

JOHN BRACKEN, B.Sc.

Quantity, value and prices.—A total of 46,110 crans of herring, valued at £219,500, was landed at Dunmore East during the 1958/'59 season. This was a 30% increase on the 1957/'58 landings. The average price per cran was 95/–. Fishing commenced on October 31st, 1958 and continued, with regular catches, until February 21st, 1959. A small number of late landings were made by local boats in mid-March, 1959.

Fishing vessels and gear.—Seventy-four boats landing at Dunmore East were engaged in the fishery during the season, a similar number to that in the previous years. Of the total, sixty-eight boats were Irish, including sixteen boats from County Down, while the remaining six boats were English. No information is available as to the number of other vessels of foreign registration which did not land at Dunmore East.

Five different types of gear were used as follows :—

	Irish Boats	English Boats	
Ring-Net	37	—	
Vinge Trawl ..	19	—	
Purse Seine	2	3	
Whiting Seine ..	9	—	
Drift-Net	1	3	
	68	6	Total=74

Before Christmas the ring-nets landed 80% of the total catch but by mid-January the majority of them had ceased fishing. They were replaced by trawlers, mainly from County Down, using vinge trawls. These boats landed 70% of the catch from mid-January to the end of the season. In 1958/'59 local boats, using whiting seines, failed to land appreciable catches. In the January/February period, 1958, these boats landed 75% of the catch mainly from Baginbun Bay.

Monthly landings.—The monthly landings in Ireland were as follows :—

November	..	10,202
December	..	12,074
January	..	10,890
February	..	9,944
March	..	3,000
Total	..	46,110 crans

The average weekly landing was 2,700 crans, with a peak in the week ended 20th December, when 5,200 crans were landed.

Location of fishing grounds.—Before Christmas Irish boats fished mainly West of the Hook and heavy catches were made within 12 miles of the Hook itself. Only light catches were made before Christmas East of the Hook. Several landings from off Dungarvan Bay before Christmas were mainly small herrings. After Christmas Irish boats made all their catches East of the Hook comparatively close inshore. Bearings supplied by the skippers of the fleet show that a gradual inshore movement occurs in January, February and March into Baginbun Bay, where spawning almost certainly takes place (See Fig. 1).

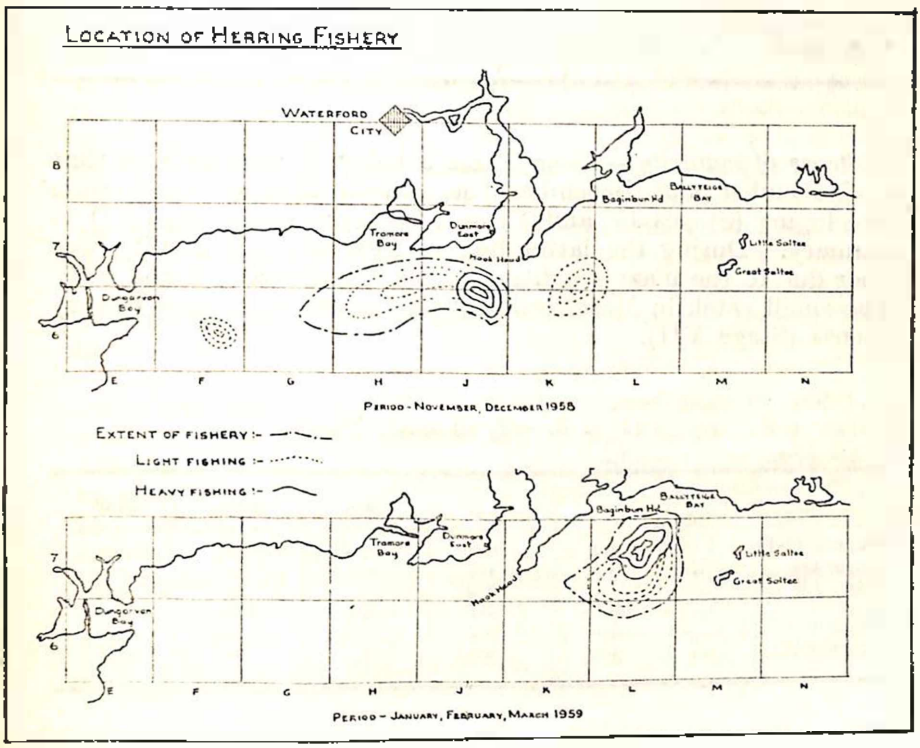


FIG. 1. Location of herring catches 1958/59.

Sampling.—Samples of herring were obtained from November 18th to December 20th and from January 9th to February 21st. These samples were examined for length, weight, sex, maturity and condition. Fish numbering 145 were examined and age was assessed for most of them. No samples of the herrings landed in mid-March were obtained.

Age determinations.—Age determinations for the 1958/'59 season indicate a paucity in recruitment because the two and three-year olds were relatively scarce. The dominant age groups recorded were 5, 4 and 7 year olds, in that order.

TABLE 2.—Age determinations.

Age in Years :	2	3	4	5	6	7	8	9	10	10—
No. of Rings	1	2	3	4	5	6	7	8	9	10—
Nov.	3	4	50	72	20	34	7	3	1	—
Dec.	22	16	65	84	38	60	29	5	1	1
Jan.	29	13	64	67	57	60	47	13	4	6
Feb.	8	19	100	102	117	89	72	22	6	3
Total = 1,413	62	52	279	325	232	243	155	43	12	10
% of Total ...	4·4	3·7	19·7	23·0	16·4	17·4	11·0	3·0	0·9	0·7

Stages of maturity.—From Table 3 below it may be seen that in November and December the gonads of both sexes were developing (Stages IV and V) and becoming full (Stage VI) in January. During the latter half of February the quality was poor due to the mazy condition of the fish (Stages VI and VII) The small catch in March was entirely made up of poor quality spents (Stage VII).

TABLE 3.—% of each Stage.

	Nov.	Dec.	Jan.	Feb.	Mar.
Stage VII-II ...	3·3	10·9	9·2	—	—
Stage III	0·4	1·5	—	—	—
Stage IV	24·6	15·5	—	—	—
Stage V	66·0	57·1	22·6	18·4	—
Stage VI	1·6	5·2	61·4	72·2	—
Stage VII ...	4·1	9·8	6·8	9·4	100

APPENDIX No. 25.

NOTES ON LOBSTER STORAGE IN IRELAND

By

F. A. Gibson.

There are four major tidal storage ponds on the Irish coast. These are at (1) Goleen, Co. Cork; (2) Waterville, Co. Kerry; (3) Cleggan, Co. Galway, and (4) Kincasslagh, Co. Donegal. There are re-circulating lobster ponds at (1) Kinsale, Co. Cork; (2) Waterville; (3) Ards, Co. Galway; (4) Cleggan, and (5) Dublin. The storage capacity of the tidal ponds ranges from 15 to 30 tons and that of the re-circulation ponds from 2 to 10 tons.

The physical conditions of a tidal pond were studied in July, 1956. This type of pond is normally used for both lobsters and crawfish. The mortality amongst lobsters in it is as much as 10% per annum. Salinity, oxygen and temperature readings were taken daily in the pond. The salinity remained relatively constant. The temperature of the water fluctuated by as much as 8°F and the oxygen content from saturation to 0·2 parts per ml. The variation was greatest during neap tides and lobster mortality was highest at this time also. It was concluded from these results that the factors of oxygen and temperature were too variable to permit the recovery of lobsters which may have been badly handled by the fishermen and/or suffered unduly during transit to the pond.

In 1957 the storage of lobsters in a re-circulating pond was studied. This pond is divided into compartments, each capable of holding 350 lbs. of lobsters. Thus preferential treatment can be afforded to weak and maimed lobsters. The salinity, oxygen and temperature conditions in this pond were found to be constant. These factors were largely responsible for the operation of the pond with a mortality of less than 5%. The pond is situated well above sea level and sea water is pumped directly into it for about 2½ hours on either side of high water. For the remaining part of the day the water is circulated through the compartments by pumps.

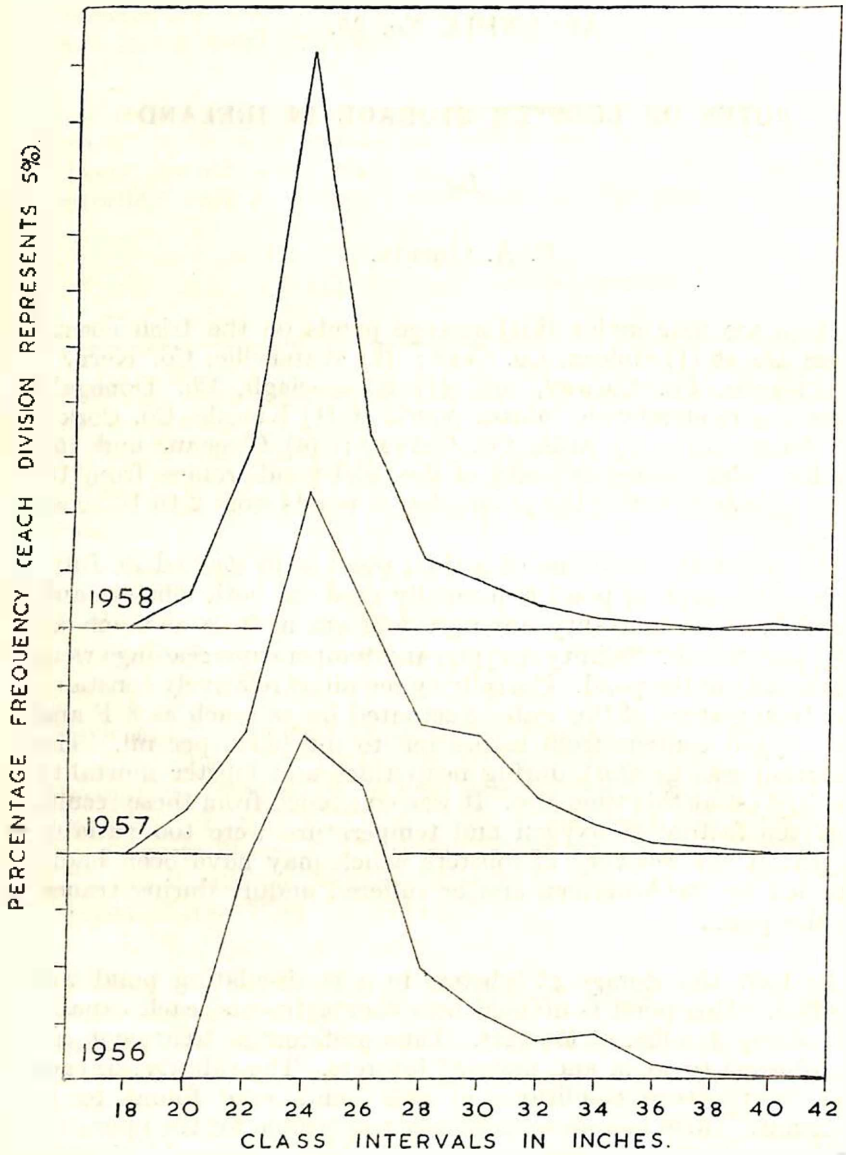
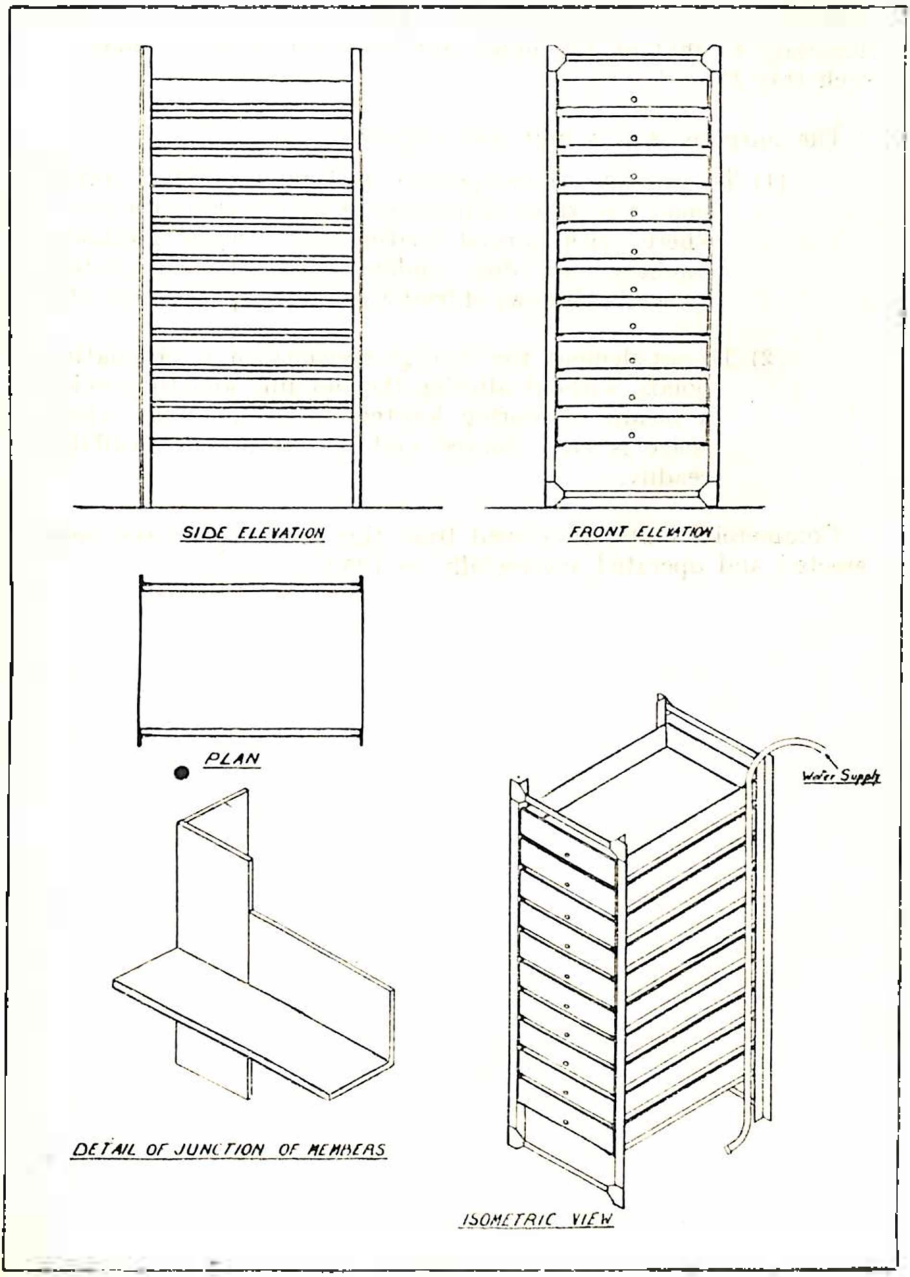


FIG. I. ESTIMATED SIZE DISTRIBUTION OF THE CATCHES.

In 1958 a pilot unit for the storing of lobsters in vertical tiers was developed (Fig. 1). This unit was operated in a re-circulation pond during July and August. The principle of this system is an iron framework into which wooden trays are inserted. A $\frac{1}{2}$" alkathene pipe, bored opposite the trays, delivers jets of water at a rate of approximately 1/10th of a gallon per minute to each



tray. Thus the trays are filled with well aerated water and the excess flow cascades over the tray sides into a sump at the bottom of the unit from which it is re-circulated to the trays. From 19 to 30 lbs. of lobsters were stored in each tray. They were examined daily over a period of four weeks, and in that time the mortality was less than 1%. A high proportion of the mortality was due to egg shedding females, which have been noticed to die readily in captivity. To examine the trays it was necessary to shut off the pump and open the drainage holes in each tray (Fig. 1).

The purpose of this unit was twofold—

(1) To provide an inexpensive method of safely storing small quantities of lobsters at points along the coast where, with normal floating box storage methods, conditions are often rendered unsuitable for lobsters by sudden inflows of freshwater from spate rivers, etc.

(2) To supplement the storage capacity of re-circulating ponds, without altering the building and to provide a means of storing lobsters in urban areas where space is very limited and sea water not available readily.

Commercial units, developed from this prototype, have been erected and operated successfully in 1959.

Wt.—. C27044/A. 550. 7/60. C.&Co. (565). G.9.